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The Anne MacKenzie Oration.[1]

AVENUES OF PROGRESS IN MATERNAL WELFARE.

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BEFORE commencing my address, I desire to express my appreciation of the honour of being chosen to deliver the Anne MacKenzie Oration for this year. I understand that each oration should not only outline recent progress in some branch of medicine and familiarize the public with any new trends of thought, but should also point out the practical application of such new knowledge.

My task in this respect is not made any easier because last year Dame Constance D'Arcy fully reviewed the problem of maternal mortality, and much of my address must duplicate her comprehensive survey of the position in Australia. However, the problem is so vital to the future of the Commonwealth that a restatement of the position, and, in particular, a review of what is essential for improvement, will not be out of place. The truth of Sir George Newman's phrase: "Motherhood is the first asset of any nation" has been rather neglected in the past and it is right that it should now come to the forefront. The medical profession cannot be expected to work miracles, nor can the health authorities keep people well by legislation alone. There is a personal as well as a community duty incumbent on us all that good use should be made of the knowledge that we possess and of the opportunities lying at our door which are so frequently ignored.

[1] Delivered at the Institute of Anatomy, Canberra, March 3, 1936.

The maternity services of most countries have reached their present stage of development by a rather haphazard process of evolution, in which each step forward represented an attempt to meet the immediate necessities with whatever resources were available. Until the sixteenth century the knowledge and practice of obstetrics had scarcely advanced beyond that of the earliest days when the work was entirely in the hands of midwives, mostly untrained and self appointed. The physician or barber-surgeon was summoned only when delivery was impossible without some mutilating operation which only too frequently meant also the death of the mother. During the sixteenth century considerable technical advances were made by two Frenchmen, Paré and Mauriceau. The former was the first to undertake the training of midwives, and both have had their names honourably associated with certain operative manœuvres. Later in the seventeenth century the obstetrical forceps were invented and were gradually adopted into practice during the following century when the great British obstetrician, Smellie, laid down the real foundations of modern obstetrics. This eighteenth century was a milestone in obstetrical progress. Smellie, for example, began what we now term the out-patient department or district as a means of training his students. The first chair of midwifery was founded in 1726 at Edinburgh, but the compulsory inclusion of the subject in the medical curriculum was not accomplished until exactly fifty years ago.

During this last period we note the commencement and development of various organized efforts to promote the health of mothers and young children. These efforts had different origins and proceeded along independent lines, but gradually coordination took place with the formation of the maternity and child welfare movement. At first attention was mainly centred on the need to reduce infant mortality, and this has succeeded in an astonishing fashion in most countries. But closer investigation showed that the losses of infants in the early days of life had not been diminished to the same extent and that any improvement in this respect was closely bound up with the care of the mother during her pregnancy and delivery.

Until the dawn of this century most attention had been devoted to the complications which might arise during delivery. Then came the pioneer work of Ballantyne at Edinburgh on ante-natal care and a complete change of attitude of mind to the subject. This was accelerated by the wastage of life during the World War, after which the peoples of most countries took an active interest in public health and in the conservation and prolongation of life. The interest translated itself into action in devious ways, some wise and others the reverse. Many of the mistakes arose from an inadequate knowledge of the factors entering into the problem. The danger of generalizing and of advocating certain lines of action without a full knowledge of all the data was especially great in the campaign against death and disablement of puerperal origin.

At first ante-natal supervision was considered to be primarily a search for the abnormal and its correction. Thanks to the efforts of Fairbairn this standpoint has been altered within recent years. It was recognized that abnormal states did occur, but only in the minority of cases. What was of greater importance was to be able to detect slight variations from the normal, and also to be able to show to patients how the normal state of affairs could be maintained throughout pregnancy—what Fairbairn called constructive physiology. This new viewpoint has shown us that there are many gaps in our knowledge of what constitutes the normal in pregnancy and labour. One outstanding problem at present is how to secure a normal delivery in a patient who is apparently in good physical condition. Incoordination of the powers or forces of labour is by far a commoner cause of delay at that time than mechanical hindrance. Little is definitely known of all the factors producing or inhibiting good uterine action. It is certain that fatigue and the psychological elements of loss of self control and lack of confidence in one's own power and ability play an important part in the problem.

For too long has obstetrics been treated as if it were a separate subject having few connexions with general medicine and surgery. The concept of ante-natal supervision as an attempt to appreciate the normal has shown that obstetrics cannot be regarded as an isolated unit, but is closely related to the other subjects in having a common objective, the raising of the healthiest stock with the least damage to the old. As Fairbairn has so well expressed it:

> Formerly obstetrics was thought of entirely in terms of childbirth and management, but with the development of the principles of preventive medicine the centre of gravity has shifted backwards to pregnancy and supervision in order to maintain health at the highest level and to anticipate all foreseeable complications. This anticipatory vision may also include the investigation of women before the occurrence of pregnancy, *i.e.* of their fitness for reproduction.

The intimate relationship between obstetrics and the rest of medicine is well illustrated by the interaction between it and pædiatrics. The immediate care of the infant at birth is part of the management of labour. The function of lactation falls between both subjects, for it commences with measures undertaken during pregnancy. Illness and ignorance of the mother both contribute to early infant mortality, and the neo-natal death rate is dependent on such factors as maternal toxic states, prematurity and birth injuries. Thus the maternity problems facing us assume a much wider aspect and their solution is seen to be more complicated and to require a longer view than some writers would have us believe. The report of the British Departmental Committee contains a wise paragraph which accurately reflects the present-day view of the problems involved in the investigation of maternal mortality:

> It is the whole physical upbringing of girls in infancy, school age and in adolescence to which we must give attention, if we would lay enduring foundations of sound physique in women enabling them to withstand the stresses and strains inseparable from pregnancy and maternity. No intelligent community which disregards or is careless of the bodily health of its childhood or adolescent womanhood should be surprised if their physical and mental capacity fails satisfactorily to meet the natural demands of human life. The problem, especially in a time of

rapid social development in an industrial and urbanized community, cannot be solved by any narrow or short-cut methods applied at the last minute.

The Effect of Social Changes in General.

What effect have social changes within modern times had upon obstetric problems in general? It is difficult to answer this because of the scarcity of material and also because of the vagueness and gradual nature of the changes and the difficulty of obtaining accurately comparable statistics. Is it true as some contend that maternity cases are becoming more difficult? Dame Janet Campbell asks whether the parous state of the mothers might have an effect on the risks of the average delivery. The factors generally blamed are: (i) the relative increase in the number of first births with restrictions in the size of the family; (ii) the increasing average age of mothers; (iii) changes in the methods of delivery, especially the increase in operative measures; (iv) periodic variations in the average size of the birth passages (Dame Kathleen Vaughan is a strong supporter of this theory); (v) increased incidence of abortions.

We are indebted for an answer to Collier, who studied these factors in a district where he had complete records for nearly a century. His conclusions are that changes in the parous state have not affected the problem in the last quarter of a century and have had little effect over the whole period. Similarly changes in the shape of the pelvis have had no appreciable effect, for it would take generations before any great change in this respect could be noted. But other factors have made a difference. The modern life of women and the knowledge of the benefits of anæsthesia have combined to make many less resistant to pain and also to render the uterine powers less efficacious. Hence there is an increase in operative deliveries, with the added risk of infection and disability. The part played by abortion in the problem will be dealt with later.

The Statistical Position.

During the recent Jubilee Appeal the public was confused by statements concerning the maternal mortality rate in different countries. Unfortunately comparisons of Australia with other countries were made which were inaccurate and which also tended to make the public believe that in this respect Australia was much worse than is the case.

It must be understood that statistics of child bearing show the price paid in maternal deaths for every 1,000 live-born infants. The deaths include not only those of mothers who died at term, but also deaths from other causes operating at earlier periods, for example abortion, extrauterine pregnancy, and general diseases associated with pregnancy. The classification of such deaths was agreed upon by an international gathering of statisticians at Washington and the schedule is in use in most countries. While the list may satisfy the statistician, it does not meet with professional approval, for we find it hard to understand why a rate purporting to represent the risks of childbirth should include conditions operating at periods far removed from term. However, for the purposes of international comparisons the rate could be accepted if all the signatory States carried out the classification in its entirety. This we know to be far from the case. In England two tables are shown, one giving the usual causes, and a second those deaths due to diseases associated with pregnancy, such as kidney disease *et cetera*. In neither instance are criminal abortions included, as is done here. It is difficult to understand why the incomplete English rate, comprising the first table only, is always compared with our rate from all causes, for the true position is that the English figures are as high as or higher than ours.

The whole position regarding the compilation of statistics is confused, and it is to be hoped that, when the next revision of the classification is due, obstetricians will be permitted to assist in arriving at a formula which will really show the risks attached to child-bearing at term, and that all countries will adhere to a full presentation of their losses, without reservations and omissions. The present system causes bewilderment to the careful practitioner and affords an opportunity to the propagandist to alarm the public with foolish inaccurate statements.

Summary of Recent Investigations in Australia and Abroad.

The outstanding reports in the English-speaking world of recent years have been the Departmental Report of the Ministry of Health, 1932, and that from New York in the following year. Both have dealt in detail with the problems facing these countries, and both contain many recommendations similar to those expressed in my own report of 1928. They present a contribution of considerable value: the collection of data from a large number of deaths, and an attempt to determine the real cause of such losses. The committees searched for what was termed the "primary avoidable factor", that is, the first omission, mistake or misjudgement by the professional attendant or the patient herself in the train of events leading to the fatal issue. This was found in nearly half the cases, but considerable caution must be observed in drawing conclusions. It is not at all easy to establish one part of a cycle of events as the primary cause, for often other factors, arising long before the pregnancy concerned, are the real cause, and these may not be stated in the returns submitted. With some of their conclusions we are not concerned, for conditions here are different not only as regards the distribution of the population, but also the conditions of medical practice. However, other recommendations confirm what expert opinion here has expressed on many occasions.

Meanwhile in Australia we have been far from inactive. In 1925, after some preliminary investigations, the Melbourne Permanent Post-Graduate Committee, instigated by the late Dr. Dunbar Hooper, offered a prize for an essay on the subject, which was won by the present Director-General of Health of New South Wales (Dr. E. S. Morris). This essay, as well as those others honourably mentioned, covered the problem admirably and made valuable suggestions. In the same year the report of the Federal Royal Commission on Health was issued, and again suggestions were advanced, but nothing came of

this report. Then, thanks to the Edward Wilson (*The Argus*) Trust, a grant was made to enable a thorough investigation of the problem in Victoria. The final report was issued in 1928, and one recommendation was acted upon: the establishment of a full-time Chair of Obstetrics at the University of Melbourne in 1929. During this year Dame Janet Campbell visited Australia and made a comprehensive report to the Federal Government. Naturally her recommendations were based on lines similar to the British scheme, and the main criticism which can be made is that it did not take local conditions into sufficient account. Nothing further was done in the Federal sphere, but in various States slight advances were made by local authorities and organizations. In this respect I would stress the value of the work of the Victorian Bush Nursing Association, which showed clearly how better results might be obtained.

On the occasion of the Silver Jubilee of his late Majesty King George V the Federal Government conceived the admirable idea of a nation-wide attempt to improve maternal and infant statistics. In each State committees formulated plans, which were collected by the Federal Department of Health and discussed at Canberra last March. At the same time Dame Constance D'Arcy delivered the Anne MacKenzie Oration, which summarized in an admirable fashion the present state of affairs. The suggestions from each State were discussed by the responsible health officers of the Commonwealth, with whom I had the honour to be associated as a technical advisor. The final result was a scheme which was practical in its aims, and we left Canberra feeling that at last a considerable advance in the campaign was about to start. The conference decided that if anything worth while was to be accomplished it would require an expenditure extending over five years. It was proposed to ask for an annual subsidy of £1 per infant in each State for this period. A single grant was considered hardly to meet the requirements nor to allow of definite results such as could be expected to follow a long range plan.

After considerable delay it was announced that the Federal contribution would take the form of a cash grant to each State instead of a subsidy spread over a definite period, when the results obtained could be reviewed and further action decided upon. To say that this was a disappointment to those most interested, and who had been led to believe that something was at last to be done to carry into effect the numerous inquiries held in Australia, is to put the matter mildly. We had been told by the Minister of Health of that day that "whatever it cost, the Government would find the money to deal with the problem". So far no explanation has been forthcoming for the rejection of the financial details of the plan. One is regretfully led to the belief that the Federal action to celebrate the Silver Jubilee was more a spectacular gesture than one likely to lead to any permanent improvement. The basic fact remains, however, that the recommendations of the Federal Health Council must still be regarded as those which, if adopted, will lead to a lowering of the mortality rate.

Let us, therefore, review these decisions and discuss some of the reasons for considering them to be adequate as a means of improving the present position.

The Training of the Professional Attendant.

The training of the professional attendant has been placed in the forefront of all reports on the subject, and has received very close attention within recent years in Australia. Dame Constance D'Arcy referred in detail to the course at Sydney. That in Melbourne closely resembles it, and from my knowledge as an extern examiner for Adelaide the students there undergo a thorough training. In many respects the instruction is much more practical than in most European countries, and graduates qualify with a sound knowledge of obstetrics and infant welfare.

The importance of the work has been emphasized in an inquiry into the professional training of the student by a committee appointed last year by the University of London. The members of the committee stated that, as modern conditions of practice made the recently qualified graduate immediately a possible consultant in obstetrics, the test of his skill should be the last step in the whole curriculum. To this end they proposed to divide the final examination into two parts: the first comprising medicine, surgery and pathology, and a second consisting of obstetrics, diseases of children, public health and state medicine. It is to be hoped that the General Medical Council will give this suggestion its earnest consideration.

The period of study for the obstetric training of nurses has been increased in all States from six to nine months for those already possessing a general certificate, and to eighteen months for women with no previous training.

In every State there are energetic post-graduate organizations, and both in Sydney and Melbourne special emphasis has been laid on obstetric refresher classes. Besides conducting such a class for many years, the Women's Hospital, Melbourne, has during the past five years established a similar course for nurses. These activities are quite apart from the meetings of the British Medical Association in each State, when obstetric problems are frequently discussed. From this it will be seen that Australia has not been lagging in the training of the obstetric attendant both before and after graduation. Still we cannot rest, but must be prepared for even greater efforts.

Within the past seven years a British College of Obstetricians and Gynæcologists has been formed, and in matters concerning obstetrics it has been instrumental in assisting the Imperial Government. One of the main activities has been the granting of membership by examination to younger graduates who have held obstetric residentships. Australia has been active in presenting such candidates, and their standards have been such as to evoke from the board of examiners praise for their initial instruction. Many men and women already specializing in this branch in Australia are Fellows and Members of the College; thus the Commonwealth is rapidly acquiring a corps of specialists, available for consultant work,

and also competent to assist governments in any schemes to improve the present situation.

In Australia one of the chief difficulties in the way of advanced work at the universities has been the stress of routine teaching duties which tends to sap the energies of the head of the department. In Sydney the Chair is a part-time one with a fairly liberal allowance for members of the teaching staff. Melbourne has a full-time Chair, but the allowance for the teaching staff, apart from the professor, is meagre indeed. In neither case is there to any extent provision made for research work. To meet this difficulty it is essential, first of all, to give the professors adequate assistance so that they will not be worn out with routine teaching, and, secondly, to give encouragement to graduates to carry on research under direction.

The universities in Australia have also tended to become too self-centred because of their geographical situation and lack of funds to exchange professors for examination purposes. Such an exchange should be possible, and would react in a most beneficial way on the standards and coordination of teaching throughout the Commonwealth.

Extension and Improvement of Hospital Facilities.

The recommendations of the Federal Health Council included a reference to a model maternity centre in each capital city. This would naturally mean for those with medical schools the use of the main training centre. Some of these will require additions to buildings and equipment to make them adequate for the purposes of such a centre as the focus of work in the State. In Victoria we are indebted to the magnificent donation of Sir Charles Connibere, which will be utilized to erect a pathological block at the Women's Hospital. This will enable the hospital to utilize the clinical material to the fullest extent for the benefit of obstetric practice not only in the State but throughout the Commonwealth.

Hospital facilities as regards obstetric requirements have been steadily increasing in all the States, and the standards of the private and intermediate hospitals have shown great improvement within recent years. In the larger centres of population obstetric units should be separated from those devoted to general work. It is not absolutely necessary, though preferable, to have them placed in a different locality, provided that the staffs and equipment are kept separate. In many country centres this separation is not economically possible, and the growth of maternity units attached to general hospitals is an admirable feature of recent developments in all States. The Victorian Bush Nursing Association has shown that for the smaller centres obstetric work can be carried out under the same roof without risk to the patients, provided adequate care is taken to prevent cross infection.

One of the urgent needs, in Melbourne at least, is the erection of a separate block for the reception of patients with suspected or proven sepsis. Such a block would accommodate all classes of patients, especially private patients, for whom there is no adequate provision at present. In the smaller centres what is required is not a separate building for isolation, but a ward fully equipped and isolated from the other wards and associated with the traditions of intelligent nursing.

Within recent years the development of the almoner system has meant much to the larger obstetric hospitals in attending to the conditions of the homes of patients, in assisting in the provision of an adequate diet for the mother and, generally, in making arrangements for the care of the family at the time of delivery. This adjunct to hospital facilities is still in its infancy in Australia, and is capable of expansion as rapidly as possible.

The after-care wards of the Melbourne District Nursing Society have also been most valuable in affording longer convalescence for patients who cannot be kept in the hospitals because of lack of bed space. The value of such extra rest in restoring the mothers to normal health has been much appreciated by those who have availed themselves of this accommodation. The system is capable of extension, especially in the larger country centres.

The control and inspection of hospitals and nurses is a State matter, and as far as Victoria is concerned there is room for much improvement. This is entirely due to lack of funds, and as long as this continues the Health Department will continue to be seriously handicapped, until public opinion arouses the necessary political action. It does the State no credit, for example, that the Nurses' Board is not truly representative of all nursing interests, that only one inspectress is available for the overseeing of the obstetric hospitals in the State, and that no attempt has been made to investigate maternal deaths as has been done in New South Wales. The principle underlying the phrase above the door of the New York Health Department, "Public health is purchasable, and within limits a community can determine its own death rate", has a very real application to the aspect of State responsibility to this question.

Facilities for Ante-Natal Supervision.

While most intelligent women realize the importance of ante-natal supervision, every investigator has stressed the need for more intensive supervision, especially in the metropolitan areas. Broadly speaking the object is to insure that the period of pregnancy shall be free from adverse influences and shall result in the safe delivery of a healthy child to a healthy mother. Expectant mothers suffer from all sorts of complaints, most of them minor ailments, but some serious, and it is important that all should be recognized early and properly treated. Dental disease is especially important as a source of lowered general health in pregnancy and of danger during childbirth from the risks of infection. Valuable work has been performed by the Dental Hospital, working in association with the ante-natal department of the Women's Hospital, Melbourne, as regards the dental requirements of the patients. In addition, research into the problems of dental caries during pregnancy has been facilitated by this cooperation.

The limelight has been focused principally on sepsis, and it is often forgotten that many of the avoidable losses could have been prevented if patients had availed themselves of the supervision of the

medical profession. As sepsis to a large extent follows operative procedures due to ante-natal complications, control of the latter factors will greatly reduce the risks at term. It would appear, therefore, that the septic factor is most susceptible to such indirect methods of attack.

Much good has come from the ante-natal clinics established at the various centres of the associations connected with infant welfare, and it is generally urged that these facilities should be greatly extended and placed under medical supervision. The scheme has been well tested in Great Britain, but the effect of such supervision in reducing the maternal mortality has been disappointing. To the official mind it seemed the right thing to appoint a doctor to supervise such work, but it was forgotten that such a medical attendant was not responsible for the subsequent delivery and after-care. Continuity in the medical attendance is a most important factor, and the same practitioner should be responsible for the patient before, during and after her confinement. This may be accomplished either by reserving obstetric practice for institutions and doctors with special qualifications, as suggested by some authorities in Great Britain, or else by utilizing the services of all general practitioners in every locality, naturally in association with hospitals and specialist services. This is the aim of the profession, for nothing should be done to discourage the intimate relationship between doctor and patient, which is so essential in obstetric work. It is the basis of the British Medical Association scheme for a national maternity service in Great Britain.

From my Victorian experience the main trouble in regard to ante-natal supervision still remains with the metropolitan area. For this reason the baby health centres are of considerable assistance. Their value lies in the help which can be given to urge women to attend their doctors or public hospitals. They are places of instruction in the art of healthy living, and not out-patient departments. Much social-medical instruction can be imparted in regard to hygiene and diet, the details of infants' clothes and, in particular, the methods of infant feeding. Despite the abundance of our food supplies and their comparative cheapness, there is need for instruction regarding the best way to prepare them in order to obtain the maximum caloric and vitamin advantages. The British Medical Association in Great Britain has issued a booklet along these lines, and it might well be taken as a guide for similar action here.

Great assistance can also be expected in impressing on women the need for a careful physical examination of all mothers some weeks after delivery by a doctor. This logical development of ante-natal supervision has not made sufficient headway, because so many fail to realize that much of the gynæcological disability arising from childbirth is capable of correction, if the patient is seen early after delivery. The centres also can be of the greatest value as places at which lectures may be given to young girls on domestic and personal hygiene, as well as on the details of mothercraft. Thus there is much work for these centres, quite apart from any physical examination of the women.

Puerperal Infection.

Puerperal infection is probably as old as the human race, for the earliest medical writings contain quite accurate descriptions. When hospitals were first instituted in the seventeenth and eighteenth centuries epidemics occurred and caused much concern. It was little wonder, for we read that the maternity ward in the oldest European hospital—the Hôtel Dieu of Paris—consisted of a large room with a stove in the centre and closed windows. The beds were high and curtained, and each accommodated three patients. Deliveries took place in the middle of the room. Similar virulent epidemics raged in Great Britain. In 1773 Charles White, of Manchester, who has not received due recognition, advocated personal cleanliness, ventilation, isolation and disinfection. Noticing the frequency with which sepsis followed the practice of some doctors, he emphasized its contagiousness. Gordon, of Aberdeen, in 1795 made similar observations. Nothing happened until in 1829 Collins, the master of the Rotunda Hospital in Dublin, introduced White's methods and saw his mortality fall to the lowest possible level. For some reason or other British obstetricians disregarded this example, and sepsis again became an epidemic menace.

Meanwhile in 1843 Oliver Wendell Holmes, in his famous essay, stated that puerperal infection was a contagious disease, and in the more severe forms could be traced to contagion introduced by the professional attendant. At this time in Vienna an epidemic was raging, and Semmelweiss considered that it was due to the transference of dead material from *post mortem* examinations to the living patients by students and doctors who were attending other classes besides those of obstetrics. He reintroduced those old principles of cleanliness and disinfection of the hands with chloride of lime, which had been brought to Vienna forty years previously by his predecessor, who had learnt them in England. Historians tend to give Semmelweiss all the credit, but in any case he deserves to be held in grateful remembrance, not for enunciating a new theory, but for his demonstration of the deadly nature of the treatment in vogue at that time. Again medical opinion was indifferent until the work of Pasteur and Lister showed the way and opened a new era.

Since those days many investigations have added to our knowledge, but sepsis still remains the main cause of maternal deaths, despite greater precautions and better technical methods. Our knowledge of the problems of infection is still imperfect, and we appear to be searching through a murky atmosphere of low visibility. The matter is not so simple as some would have us believe. Extensive epidemics occur much less frequently than in the past, but sporadic outbreaks are far from infrequent, and it is by no means easy to trace the source of the infection.

We know that the streptococcus is the most important organism concerned, and that it is usually responsible for all grave and epidemic cases. Lowered general resistance, due to hæmorrhage before or after delivery or to toxic states, plays a part. Probably the majority of cases are associated with prolonged delivery that requires interference when the

devitalized tissues are unlikely to be able to resist infection. Much work has been done regarding the sources of the infection. In the majority of cases it has been conveyed to the patient from outside, either during examinations or manipulations, and in some instances when there has been no interference whatever. For a long time the question of autogenous infection has been debated, that is, infection from organisms already in the passages or conveyed thence by the blood stream from some distant focus. Recent work shows that, though organisms are frequently present in the passages before labour, they are not important factors in the causation of infection.

Evidence has been accumulating that many patients are infected by streptococci from the respiratory tract of attendants who are carriers, even when no examinations have been made nor any manipulations performed. This important question of "droplet infection" engaged the serious attention of the British Committee on Maternal Mortality, and their conclusions are as follows:

1. The majority of infections by hæmolytic streptococci are due to the transfer of the organisms from the throat or nose of someone in attendance upon the mother either during delivery or later. This transfer may be through direct contamination by coughing, sneezing or speaking during labour, or indirectly by the hands or instruments accidentally soiled by spraying or contact with other contaminated objects.

2. In a minority of cases the organisms are conveyed by the mother's fingers from her throat or nose to the genital tract.

3. Streptococci already present in the genital tract are responsible for only a few cases.

4. Many of the throat-carried streptococci are probably harmless, being, like those already in the genital passages, in a permanently non-virulent condition, but we have no simple means of ascertaining this in any individual case. All known carriers must, therefore, be regarded with suspicion.

5. There is clinical evidence for regarding the carrier with signs of recent infection, *e.g.* acute sore throat, tonsillitis or antral trouble, as much more dangerous than the intermittent carrier who is habitually free from such infection.

Dora Colebrook has recently brought forward convincing evidence that, in our concentration on the patient herself and the professional attendants, we are apt to overlook another possible source—carriers among relatives or friends who may have looked after the patient in a general way without having had anything to do with the delivery.

The clinical varieties of sepsis are apparently caused by variations in the characteristics of the organisms and in the resistance or receptivity of the host. Another factor is the faculty possessed by some organisms of rapid diffusion throughout the body. Some invade the blood stream at once and leave no trace at their point of entry; others travel more slowly, make frequent stops, leaving local reactions and deposits along their path. Goodall aptly compares these two types to an express and a local goods train.

The treatment of this disease still largely remains one of prevention. During pregnancy the diet, to increase the resistance to infection, should contain extra supplies of vitamins *A* and *D*. A rigorous technique should be the rule during labour. The details could be drawn up by each State Health Department after collaboration with experts, and its use made compulsory, as has been done with success in New Zealand. The ideal substance for antisepsis has not yet been found, but the search continues for something which will augment the natural powers of the cells and serum to destroy bacteria and their products, without being injurious to the tissues. To minimize the risk of droplet infection masks should be worn by the attendants whenever they are in contact with the patient during delivery. Naturally, any person with an acute respiratory infection should not attend to the patient. For the present it must be admitted that no cure has been found and that the best results follow sensible prophylactic measures during pregnancy and labour.

In the campaign against maternal mortality it must be realized how closely bound up with the problem of puerperal infection is that of abortion, especially the self-induced variety. Abortion is responsible for at least one-third of the septic deaths, and statistics show that its incidence is increasing. Apart from the deaths, there are infinitely more numerous cases in which recovery occurs, but which leave a legacy of ill-health and much avoidable disablement. Unfortunately too many women are unaware or regardless of the risk to life and future health inherent in such procedures. The matter is a very important one and the medical profession can only wait for public opinion to become more enlightened in the matter. While it is mainly a problem for the individual, the State has also its responsibilities, and in one direction it could assist by easing the economic factor which many give as their reason for the interruption of the pregnancy. The tax exemptions for children are very low; these could be made more liberal and could also cover a wider range of income limit than at present.

The Maternity Allowance.

While the maternity allowance did not come before the Federal Health Council, one must refer to the considered opinion of the Royal Commission on Health and to other reports which state that the maternity bonus can be put to better use than it is put at present. The original intention was apparently to enable the mother to obtain comforts at a trying period in her life, and any benefits to the child were purely secondary. That it has failed to have any effect on the maternal mortality rate must be admitted, and yet it has done good in many ways. However, medical opinion considers that it should not be given without some qualifications. Victorian opinion favours the application for the allowance to be made at the fifth or sixth month, in order to eliminate delay in payment later, and also that a certificate should be produced showing that the applicant has had medical ante-natal supervision, except in those cases in which circumstances render the issue of the certificate difficult or impossible. I would favour a subdivision of the maternity allowance into two parts: (*a*) a cash payment to the mother as at present, for in the majority of cases the money is well spent; (*b*) a midwifery benefit to cover the services of the doctor and hospital when necessary, for a post-natal examination and for home help. This might well be part of the benefits in any scheme of national insurance.

This survey of the problems facing us shows that many factors are involved, and that it is the pursuit

of no single factor, but an advance in all directions, which is necessary for a gradual improvement in the situation. The outstanding obstacle in the past has been ignorance of so many of the dangers associated with childbirth. The belief that childbirth is a normal function has been handed down the ages, and the losses are looked upon with the same degree of fatalism as they were in the past. The fact that so many were known to have escaped without proper care made it more difficult to impress on the minds of many the necessity for precautions in every case.

What is the best way to put into force the plans which expert opinion considers necessary? Is it to be a national scheme with government control of all those associated with obstetrics? Or is it to be a continuation of the present methods whereby the State exercises control by means of various acts and regulations, but leaves the details of practice to those most concerned?

Government control must naturally continue in regard to the training and inspection of nurses, the choosing of sites for hospitals and their building and equipment, and any measures connected with sepsis and the investigation of maternal deaths; but in the actual conduct of obstetrics the continuation of the unfettered relationship between the medical attendant and his patient is to be desired.

There is splendid proof of the value of this system in the obstetrical records of the Victorian Bush Nursing Association, and it is all the more valuable because the system can be duplicated elsewhere if the same basic principles are followed. These principles are that the public is willing to insure when well against the risks of sickness and hospitalization, and that this is best done by a scheme of mutual cooperation. By the standardization of plans, well equipped hospitals at a low cost have been brought to areas where such provision at the low rates charged would be impossible under the ordinary conditions of private ownership of hospitals. The nursing work is performed by a highly trained and well paid staff working in close association with the local practitioners. It is recognized that it is far better to bring the patient to a centre equipped for all emergencies, where the doctor and nurse can exercise their skill to the best advantage, than to send nurses alone to outposts far from the nearest medical man. Apart from their routine work, the nurses render valuable assistance, at little cost to the State, in conducting infant welfare centres and in instructing school children in the elements of hygiene. The splendid records in regard to maternal mortality and the low figures for infant mortality are the envy of many observers in other countries, and reflect the high standards of practice maintained by the professional attendants. Close supervision of the work is kept by the professor of obstetrics, who acts as the obstetrical consultant to the Association. It is probable that a hospital scheme along the lines of the Bush Nursing Association will be started shortly in the suburbs of Melbourne and that similar advantages will thus be offered to the metropolitan area.

Within the last year we have had confirmatory evidence from Rochdale, in England, of the value of the cooperation and goodwill of everybody concerned when working on the basis of existing facilities. The creation of new machinery was not wanted in order to reduce the rate, but merely the complete use of what already existed.

In the scheme of the Federal Health Council, the Commonwealth Government was to establish a special section of the serum laboratory to study the best means of controlling sepsis by bacteriological measures and to subsidize approved research in other laboratories or universities. Though the scheme has been abandoned, perhaps we may hope that this work will still be carried out.

Owing to the different conditions of practice throughout the Commonwealth, the best method of attacking the problem is through State control. By the means of advisory committees of experts to assist the departmental officers local conditions will be adequately studied. The idea of an annual conference, such as that held in connexion with the cancer campaign, is worthy of adoption because the pooling of experiences will be all to the common good. This would apply in particular to a collective investigation of the circumstances surrounding the maternal deaths in the Commonwealth about which we know nothing at present.

Despite the lack of adequate support by the Federal Government, the Jubilee Appeal has afforded an opportunity to undertake a national stocktaking, and the ways in which reform can best be attempted are now well known. While we have no need to be ashamed of what has been already done in Australia, much remains to be accomplished before we can rest satisfied. By far the most dangerous foe we have to fight is apathy or indifference, from whatever cause—not from a lack of knowledge, but from carelessness, from absorption in other pursuits, and from a contempt bred of self-satisfaction. What is the use of boasting of our material progress if the supreme law of public health is neglected?

As has been well said, the beginning and ending of things has ever made a greater appeal than the middle, just as sunrise and sunset inspire the poet more than the glare of noon. It is curious that, though in the nature of things obstetrics was almost the earliest of medical arts, its science began to grow only within recent times. We need not be worried, therefore, if progress seems slow. An awakened public conscience will insure steady improvement and the dawn of a new era, when the risks associated with child-bearing will be possible and not probable, as is only too common at present.

In conclusion let me quote Osler, who, in one of his addresses, has expressed eloquently the part played by the medical profession in the preservation of the public health:

> 'Tis no idle challenge which we throw out to the world when we claim that our mission is of the highest and noblest kind not alone in curing disease but in educating the public in the laws of health and in preventing the spread of plagues and pestilences. Not that we live up to the highest ideals, far from it—we are only men. But we have ideals which mean much, and they are realizable, which means more. The rank and file labour earnestly for your good and self-sacrificing devotion to your interests animates our best work.

INTRAPERITONEAL ADHESIONS.[1]

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From the point of view of the welfare of the patient, abdominal adhesions may be divided into two classes: (i) benign, producing few symptoms, and not necessarily endangering his life, and (ii) grave, in which pronounced symptoms are usually present and life may be endangered.

For the purpose of convenience in speaking of the treatment of peritoneal adhesions, it will be advisable to divide them into three major groups: upper abdominal, mid-abdominal and pelvic. In each of these zones one or two lesions are usually responsible for the development of the trouble and the consequent symptoms can be regarded as typical.

Prophylaxis.

Before, however, going on to a consideration of adhesions as found and requiring treatment in each of these three zones, let us spend a few moments in dealing with the prophylaxis of abdominal adhesions in general. First of all, peritoneal adhesions, in these days when abdomens are opened for all sorts of conditions, even by practitioners upon whose diplomas the ink is scarcely dry, are extremely common. How can these adhesions be avoided? At the outset let me say that in spite of the greatest care, an odd patient will develop them. No one is to blame. There is, apparently, in some cases an unknown factor which favours the development of adhesions. Putting these aside, what steps can a surgeon take before, during and after a laparotomy to diminish appreciably or to avoid totally the possibility of the development of adhesions within the peritoneal cavity?

Before Operation.—It is now becoming recognized that the over-use of purgatives before a section causes vascular congestion of the mucosa and submucosa of the stomach and intestines with the resultant possibility of the temporary migration of pyogenic organisms through the deeper layers of the mucosa. Moreover, the increased peristalsis of the gut consequent upon the use of certain purgatives leads to a measure of mucosal congestion. Such a loop of gut, if it has to be handled much during the progress of an operation, may quite easily shed the superficial layers of its peritoneal coat and thereby invite its adhesion to another loop or to some nearby structure. It is wise, therefore, as far as possible, to avoid the use of strong purgatives, but rather to depend upon small repeated doses of cascara or paraffin oil and enemata.

During Operation.—It is beyond dispute that attention to several points in technique during the performance of an operation will go a long way towards totally preventing or greatly minimizing the formation of adhesions. The principal points to attend to are:

1. To make a clean incision through the parietal peritoneum, preferably stopping short of the top and bottom limits of the fascial and muscular incisions. By attention to this little point subsequent proper approximation of the cut peritoneal edges can be obtained without danger of tearing, especially behind the rectus muscle above the umbilicus, where there is an absence of extraperitoneal fat.

2. To protect the viscera adequately from coming into contact with the cut edges of the wound of exposure, oozing from which should be properly controlled before the peritoneum is incised.

3. To use within the peritoneal cavity pads, sponges or gauze adequately moistened with hot normal saline solution. The use of dry gauze or pads to keep the intestines out of the field is a surgical crime, as the endothelial covering of the viscera quickly adheres to such packs, which, when renewed, tear off the delicate membrane, exposing the subepithelial layer as a raw surface which will quickly become adherent to another viscus.

4. To handle the viscera, especially the small gut, with great gentleness. Rough handling and prolonged exposure leading to drying of the peritoneal coat, besides abrading the endothelium, cause a subsequent reflex neuro-muscular disturbance of the gut, which may allow the bowel to lie motionless against another loop or another organ and possibly contract an adhesion. Another subtle consequence of a degree of paretic ileus is the possibility of bowel organisms making their way through the wall to the subperitoneal coat and setting up a mild degree of inflammation which again favours adhesions.

5. To avoid the use within the cavity of any solution except normal saline solution. Mercurial preparations, especially the biniodide, are very irritating. Some years ago, in an endeavour to prevent the reformation of extensive bowel adhesions of the matting type, I poured into several abdomens a little sterilized paraffin oil. In one case, upon reopening the peritoneum about nine months later for recurrence of the symptoms, I found that the great omentum contained many tiny pellets of oil, each surrounded by a pellicle of endothelium, and that several of these small incarcerations of oil were lying free in the pouch of Douglas. Moreover, the abdomen should not be closed until all the blood clot has been carefully removed, as for some persons blood clot, even if quite sterile, is undoubtedly a peritoneal irritant.

6. To "peritonize" carefully as far as possible all raw, oozing or abraded areas within the cavity. Ligamentous peritoneal bands and omental adhesions should not be torn off their attachments, but doubly ligated and cut away between the ligatures. Nature never forms an adhesion to a slough, so that if, for instance, a piece of omentum is ligated, the ligated end cannot again become adherent. It is not so, however, if it is torn away and a raw spot is left on the peritoneal surface. When small areas of the bowel are denuded, a simple purse string suture will be all that will be required, but when a large area is denuded a segment of great omentum may be cut off and sewn to the bowel after inverting its edges, or in extreme cases the affected segment of gut may have to be resected. In the pelvis, the pelvic colon may require to be sutured to the back of the broad

[1] Read at a meeting of the Queensland Branch of the British Medical Association on April 3, 1936.

ligament or to the lateral pelvic wall to close in a dangerous raw area.

7. Finally, the great omentum, if available, should be carefully drawn down to cover the viscera and the peritoneal edges should be carefully sutured, too wide a bite of the cut edges with the forceps being avoided, and care being taken that the edges are everted, so that a smooth peritoneal surface results and the raw edges are not turned inwards.

The Treatment of Established Adhesions.

Let us now briefly turn to the treatment of established peritoneal adhesions. Here the symptoms depend principally upon the abdominal zone involved, and the treatment varies accordingly.

In the Upper Zone of the Abdomen.

In the upper zone of the abdomen the adhesions are formed usually as a sequel to one or two conditions, namely perforated ulcer (gastric or duodenal) or cholecystitis. Upon opening the abdomen one may be confronted with an appalling condition in which the gall-bladder, perhaps shrunken or sclerosed, is firmly welded on to the pylorus and duodenum and surrounded by thickened and œdematous omentum. What is to be done in such circumstances? The first thing is to get down behind the mass and palpate the common bile duct. If this is free of calculi and of crippling adhesions, the next step is carefully to dissect up the gall-bladder from its bed by injection with normal saline solution by means of a syringe and long needle. The organ will then usually strip out of its bed. The cystic artery and duct are ligated after being exposed. The gall-bladder is now removed from below up, great care being taken to separate it from the organs to which it may be attached. The gall-bladder bed is then closed by thick mattress sutures of catgut, and a drainage tube is placed down to the cystic duct stump before the balance of the wound is closed. Similarly, in dealing with perigastric adhesions due to slow leakage from a gastric or duodenal perforation or consequent upon a previous operation for a more acute condition, infinite care must be taken to keep to the planes of cleavage in separating the adhesions, and any resulting raw surfaces which cannot be closed by suturing with catgut must be covered with omental grafts.

In the Middle Zone of the Abdomen.

In the middle zone of the abdomen the worst types of adhesions are found in three conditions, namely, appendicitis, tuberculous peritonitis of the adhesive type, and descending colon diverticulitis. In each and all of these lesions the degree of peritoneal adhesions may range from a comparatively slight and easily managed condition to an extreme grade of apparently indissoluble welding of loops of gut to one another and to the omentum or other organs. Fortunately, however, there may be another and happier side to the picture, in that one occasionally finds on reopening the cavity later on that in the abdomen in which possibly months or years before there had been a very severe condition of appendicular infection or a subacute tuberculous peritonitis, practically every inter-gut adhesion has disappeared. Why this should occur I do not know. Unfortunately, however, this is a rare finding, and instead we are called upon to separate densely adherent loops of gut or omental masses. Here a word of warning is necessary. Do not attempt to free a loop of gut if you feel certain it is not at all likely to cause obstruction, that is, if it is not acutely kinked and adherent near the mesenteric border. Great care must be taken to confine the separation to the plane of diaphanous adhesions, and to ligature carefully or to suture any bleeding points. After return to bed the patient, unless there is a strong contraindication, should be frequently rolled from side to side, and should, when he recovers consciousness, be instructed to continue this himself. He should be given eserine and pituitrin or pitressin regularly for one or two days after operation, and paraffin and cascara should be the laxatives used for some time to come. The problem of dealing with the adhesions associated with diverticulitis may be a major one, demanding great judgement and necessitating possibly the drainage of an abscess, and the determination of whether or not the condition is really one of diverticulitis or new growth.

In the Lower or Pelvic Zone of the Abdomen.

In the lower or pelvic zone of the abdomen our difficulties may be quite minor, or such as to test the ingenuity of any resourceful operator. In this zone the commonest causes of adhesions are a pelvic appendicitis or the downward leakage from an ordinary appendiceal abscess; pyosalpinx, gonococcal, *post partum* or post-abortal; the inflammatory adhesion of the rectum or pelvic colon and the lower uterine segment or top of the vagina; the adhesions of some viscus, usually small gut, to the uterus or to its stump after hysterectomy; the insinuation of endometrial cysts into the broad ligament or the pouch of Douglas; or to a generalized or local pelvic peritonitis after a previous laparotomy. Here again the same general principles apply in regard to careful separation and control of all raw surfaces and bleeding points. It may be necessary, and even absolutely advisable, to remove the uterus and one ovary—seldom both—in an endeavour to obtain a "clear pelvis". If this extreme step is not considered necessary or advisable, then it may be found advantageous to transfer grafts from the great omentum to cover many dangerous raw surfaces. Finally it should be borne in mind that it is not always wise to disturb an adhesion that Nature has arranged as a protective measure, unless the pathological condition which has called for the creation of the adhesion can also be safely corrected, and here one must rely upon one's own surgical experience.

THE TREATMENT OF ACUTE RETENTION OF URINE IN GENERAL PRACTICE.[1]

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I AM deeply conscious of and thank you for the honour you have done me by inviting me to address

[1] Read at a meeting of the Western Districts Medical Association at Wellington, New South Wales, on March 27, 1936.

your association today. But I feel that some apology is necessary for the rather elementary subject selected for discussion. The reason that it came to my mind is that more inquiries are made by men in general practice about the immediate treatment of acute retention of urine than about any other subject in urology. There is little that is new or original in my remarks, as I have endeavoured strictly to restrain them to the limits of general practice in the country. Still it is hoped that the systematic presentation of the fruits of experience in hospital and consulting practice may be of use to you.

DEFINITIONS.

Retention of urine may be defined as an inability spontaneously to evacuate the bladder when it contains urine. Chronic retention is the condition in which residual urine remains in the bladder after micturition. Complete retention exists when the patient is unable to void any urine in spite of a moderate or great distension of the bladder. Acute retention usually signifies that the symptom of inability to empty the bladder has been appreciated by the patient rather abruptly. It does not necessarily indicate that retention is complete, nor that a chronic condition preceded it. Overflow incontinence is a common sequel to complete or chronic retention. The bladder is distended to its maximum capacity and is frequently emptied partly by a small dribble of urine passing *per urethram*.

ARMAMENTARIUM.

For the immediate treatment of acute retention of urine a small number of inexpensive instruments are indispensable, and should always be kept in good order. In this connexion it is not generally known that gum-elastic instruments may be kept for years if they are stored dry, in a dark place, and lightly dusted with lycopodium powder.

You will doubtless agree that the following list of essential articles is very modest, but they should be of good quality.

1. A Tieman rubber catheter, size 12 French. This type of catheter is firmer than the usual Jaques, but is better tolerated by the patient when tied in position than the woven silk varieties. The olivary, Coudé tip enables it to negotiate most prostatic obstructions. Size 12 French is the smallest in which a useful lumen can be made, but larger sizes may be adopted quite successfully.

2. A gum-elastic Coudé catheter, size 18 French. This is used in conjunction with the next instrument.

3. The Saint Peter's prostatic stylet used in the manner to be demonstrated presently.

4. Half a dozen filiform bougies, sizes 2, 3 and 4 French. The tips are straight, coudé and bayonet-shaped. Whalebone should be rigorously avoided for urethral bougies.

5. A metal prostatic catheter about 10 French size. Although I have not used this for years, it is so nearly infallible for enlarged prostates and so readily sterilized that I still carry it. The long curve is calculated to enter the bladder in spite of great elongation of the urethra or a large middle lobe.

6. Two pairs of dressing forceps which are used for the insertion of flexible instruments to avoid contact with the hands.

Naturally my own kit is much more extensive, and mention will be made of the use of other appliances, but the large majority of obstructions which do not require operation can be negotiated with these few simple instruments when correctly used.

HISTORY AND EXAMINATION.

As in other realms of medicine, adequate treatment largely depends on an accurate diagnosis. Therefore you must never allow the importunities of a pain-racked patient to induce you to undertake treatment before you have obtained the salient points of the history and made a brief examination. This must include the abdomen, the external genitalia and, most important but most often neglected, the rectum.

DIFFERENTIAL DIAGNOSIS.

Retention of urine is a symptom of many diseases. The term "differential diagnosis" is here meant to imply the differentiation between retention and other symptoms which resemble it. "Ætiological diagnosis" is therefore used in the sense of determining the nature of the responsible disease.

First of all you must be assured that there is urine in the bladder. Three other conditions may be mistaken for it:

1. *Ruptured Bladder.* With a history of injury there may be suprapubic dulness and frequent and urgent desire for micturition. However, a catheter passes easily, a little urine may be withdrawn and is probably blood-stained. If a measured quantity of fluid is injected into the bladder only a part of it can be recovered by the catheter. Intravenous urography is of the greatest assistance in such cases.

2. *Anuria or Suppression of Urine.* In anuria there is no suprapubic dulness; a catheter passes without difficulty and may evacuate a little urine. If fluid is injected it is all returned by the catheter.

3. *Strangury.* Strangury is the term applied to the frequent and painful emission of small quantities of urine *per urethram*. These symptoms so resemble some cases of incontinence with overflow that well experienced persons may be deceived.

One evening a doctor asked me to see him on account of what he described as overflow incontinence during the previous twelve hours. There was no suprapubic dulness, a catheter passed readily and withdrew a few drops of urine. The patient had an intense oxaluria following a brief dietary indiscretion.

THE CAUSES OF RETENTION OF URINE.

The causes of retention of urine may be set out as follows:

I. With Organic Obstruction.

(A) Vesical Causes.
- (1) Stones, tumours and foreign bodies impacted at the internal urinary meatus.
- (2) Blood clot in the bladder.

(B) Prostatic Causes.
- (3) Simple (adenomatous) prostatic enlargement.
- (4) Malignant tumours of the prostate.
- (5) Tuberculosis of the prostate.
- (6) Fibrosis of the bladder neck, prostatic bar *et cetera*.
- (7) Acute prostatitis, prostatic abscess.
- (8) Prostatic calculi.

(C) Urethral Causes.
- (9) Rupture of the urethra.
- (10) Congenital deformities: (*a*) Bands of the posterior urethra, (*b*) stenosis of the external urinary meatus, (*c*) phimosis and paraphimosis.
- (11) Urethral tumours.
- (12) Foreign bodies in the urethra.
- (13) Urethral stricture.
- (14) Acute urethritis.
- (15) Urethral calculi.
- (16) Inspissated blood or pus at the meatus.
- (17) External pressure: (*a*) Pelvic and perineal tumours, (*b*) periurethral abscess and urethral diverticulum, (*c*) tumours of the penis, (*d*) self-applied obstructions.

II. Without Organic Obstruction.

(A) Intoxications.
- (1) Due to pathological states: typhoid fever, appendicitis, salpingitis *et cetera*. Onset of the acute fevers, especially in childhood.
- (2) Chemical: Alcohol, arsenic, belladonna, ephedrin, lead, mercury.
- (3) Endocrine.

(B) Causes of Nervous Origin.
- (4) Organic lesions of the central nervous system: (*a*) Transverse myelitis, (*b*) *tabes dorsalis et cetera*.
- (5) Organic lesions of peripheral nerves.
- (6) Hysteria.
- (7) Idiopathic atony of the bladder.
- (8) Reflex sphincteric spasm.
- (9) Simple overdistension.

ÆTIOLOGICAL DIAGNOSIS AND TREATMENT.

In order to save repetition I propose to mention the salient points in the diagnosis and then to proceed at once with the treatment of each variety.

Retention with Organic Obstruction.

From Vesical Causes.

Stones, Tumours and Foreign Bodies Impacted at the Internal Urinary Meatus.—With stones, tumours and foreign bodies impacted at the internal urinary meatus there is usually a history of intermission, or interruption of the urinary stream, hæmaturia, urgency, frequency and strangury. The symptoms may be relieved by rest in the recumbent position, and the patient may be able to urinate lying face downwards. Any of these obstructions may be dislodged by the passage of a medium sized instrument such as a sound or a gum-elastic catheter mounted on a stylet. Should that fail, attempt the intra-urethral injection of a local anæsthetic. The anæsthesia helps to relax spasm and the fluid pressure tends to push back the cause of the obstruction into the bladder. A finger in the rectum may assist the urethral instrument.

Blood Clot in the Bladder.—Blood clot in the bladder in sufficient quantity to prevent micturition is generally preceded by profuse hæmaturia. An enlarged prostate or vesical papilloma is the commonest source of such a hæmorrhage. It may be possible to feel the growth bimanually, but papilloma may be mistaken for clot unless it infiltrates the bladder wall. A few drops of very bloody urine come through the catheter, but it is difficult to recover fluid which is injected. Suction through the catheter may extract a few clots, but can never remove any appreciable quantity. In addition to the severe pain of acute distension, shock is pronounced and an immediate injection of morphine is desirable. Without special instruments such patients usually require cystotomy, and this should be performed at the earliest convenient moment. Frequently the patient has suffered for a long time from chronic retention and the additional shock makes him a poor operative risk. Generally the removal of clots and the free drainage of the bladder are all that is required for the temporary control of hæmorrhage. Occasionally diathermic coagulation or a few hæmostatic sutures are necessary, but, if possible, avoid dealing with a large tumour immediately.

Certain cystoscopes are designed with an aperture at the end of the sheath which facilitates the evacuation of clots, but with any large quantity of blood it is a very tedious proceeding. A sodium citrate solution is used for the irrigating fluid.

A blood clot evacuator was designed by Thomson Walker. This is a catheter of metal, having a long curved beak, a large bore and large eyes. The beak reaches to the anterior portion of the bladder where the contents are more fluid and moderate quantities of clot can be removed slowly through it.

From Prostatic Causes.

Simple (Adenomatous) Prostatic Enlargement.—The features of these cases are well known and require no description here. My own procedure when such a diagnosis has been made is as follows: (i) First take advantage of the favourable effects of a dose of morphine followed by a hot bath. At this stage an accompaniment whistled by an enthusiastic resident medical officer has been known to move the most adamantine prostate. (ii) Then endeavour to insert the Tieman catheter. You will note that there is a small knob on the funnel end indicating the direction of the beak. This should be turned ventrally. If an obstruction is encountered, note the distance from the meatus; if the beak is still in the anterior part of the urethra, a stricture is present. If it passes as far as the external sphincter the beak may be caught in the small blind pocket formed by the bulb just distal to the muscle, or the sphincter may be unduly irritable. When the blockage is in the posterior part of the urethra the prostate or internal sphincter is responsible. Withdraw the catheter about half an inch, rotate it slightly and push it forward again. This is repeated until the least resistant channel is found. (iii) Should the Tieman catheter fail, take the gum-elastic catheter and stylet. Thread the latter into the full length of the lumen of the catheter, making sure that it does not protrude from the eye. Then pass the combined instrument into the urethra up to the obstruction. Withdraw it half an inch, then, holding the catheter still, withdraw the stylet an inch more. This causes the beak to move anteriorly, when it will ride over a large middle lobe as it is again pushed onwards. A finger in the rectum may be an appreciable help in this manœuvre. (iv) If these measures are unsuccessful, have resort to the metal catheter. The utmost gentleness is required to avoid injury, and only sufficient urine is drawn off to afford temporary relief. However, the associated œdema is usually diminished sufficiently to permit a soft

instrument to pass later. Metal instruments should never be tied into the urethra owing to the liability to cause sloughing. (v) If one of these manœuvres has not proved successful, cystotomy must be advised. In the absence of proper facilities for immediate operation, suprapubic puncture with a lumbar puncture or serum needle under local anæsthesia will relieve the situation. Again, the needle must be removed as soon as a sufficient amount of urine has been drawn off.

I hope it is not necessary to remind you that more harm may be done by removing an excessive quantity, at one time, from a chronically distended bladder, than by leaving it distended, although the patient may not concur with this view at the time. At first it is sufficient to permit enough urine to escape to relieve pain; thereafter three ounces per hour is a fair rate of decompression. Omission to observe this rule frequently has most serious late sequelæ even in apparently robust patients.

Malignant Tumours of the Prostate.—Malignant tumours of the prostate are managed in the early stages in the same manner as the simple enlargements; in fact they are extremely difficult to differentiate while the bladder is distended. The clinical diagnosis rests on the rectal examination, which may disclose hardness, immobility, nodularity and infiltration at the lateral margins of the gland.

Tuberculosis of the Prostate.—Tuberculosis of the prostate is very rare in this country. The diagnosis depends partly on palpation of the gland and partly on the discovery of tuberculous foci in the genito-urinary tract or elsewhere. Treatment of acute retention from this cause is on the same lines as that due to adenomatous enlargement.

Fibrosis of the Bladder Neck, Prostatic Bar et cetera.—Fibrosis of the bladder neck, prostatic bar *et cetera* presents considerable difficulty in diagnosis to the clinician. Those not widely experienced in rectal examination will fail to detect the moderate but unusual firmness, the lack of elasticity and the slight fixity in a gland which is somewhat smaller than the average. In the same clinical category are glands with a small adenomatous growth, but having a "parrot-beak" intravesical projection below the internal urinary meatus. These present no difficulty to the Tieman catheter.

Acute Prostatitis and Prostatic Abscess.—The patient with acute prostatitis or prostatic abscess is a young or middle-aged man, and frequently gives a history of urethritis. Some cases are metastatic and unrelated to any gonococcal infection. The prostate is tender; it may be soft or tense, but is unusually smooth and may be distinctly warm to the touch. If an abscess has formed an area of fluctuation may be found. Antiphlogistic measures are required; morphine or the morphine and cocaine suppository followed by hot baths, copious bland fluids, warm saline enemata and ice packs on the perineum are all useful. If necessary, a soft rubber catheter may be passed gently.

Prostatic Calculi.—Prostatic calculi are always associated with chronic prostatitis, and may be easily mistaken for carcinoma. Sometimes the grating of stones may be felt, especially if the rectal examination is made with a sound in the urethra. They are seen radiographically, as a small horseshoe-shaped group of shadows in the region of the pubic symphysis. The rubber catheter seldom fails to enter the bladder.

From Urethral Causes.

Rupture of the Urethra.—The cardinal features of rupture of the urethra are a history of injury, blood at the meatus, perineal pain, swelling and ecchymosis. If you suspect rupture, at once instruct the patient not to void urine. Nor should you attempt to withdraw any by catheter until you are prepared to proceed at once to operation. The precise form of the operation depends on the site and degree of the tear, but the principles are the same, namely (i) derivation of the urine, (ii) evacuation of clots and drainage of any extravasated urine from the tissues, (iii) repair of the torn urethra. Even if you are able to establish efficient catheter drainage and are satisfied with that method, it is still most desirable to evacuate clots and to repair the urethra.

Congenital Deformities.—Congenital deformities that must be considered include bands of the posterior part of the urethra, stenosis of the external urinary meatus, and phimosis and paraphimosis.

With bands of the posterior part of the urethra the main difficulty lies in the diagnosis. The obstruction usually occurs in infants; the bladder is distended, frequently without much apparent discomfort, but the child is likely to cry before and during micturition. The urine comes away in drops or in a poor dribbling stream. Instruments pass readily, for the obstruction is in the nature of a flap valve which prevents the outward passage of fluid, but does not interfere with anything entering the bladder. A metal instrument may rupture the valve so that cysto-urethroscopic examination may disclose only a few bleeding tags of mucosa in the urethra. Should the bladder be opened before the valve is torn the retrograde passage of a sound is impeded by the bands.

Stenosis of the external urinary meatus is far more common than one would expect. Even in adults it is found in a large proportion of those referred on account of complications of urethritis. Meatotomy is all that is required to remedy the defect.

Phimosis and paraphimosis require no description. It is sufficient to remind you that, in the presence of much inflammation or œdema, it is wise to be content with a dorsal slit in the first instance. Circumcision may be completed when the parts have resumed their normal dimensions.

Urethral Tumours.—Urethral tumours rarely cause complete retention of urine, although chronic obstruction is more frequent. An instrument is usually passed before the diagnosis is made, and it is well to leave it in position until arrangements are made for the management of the tumour. In the presence of a malignant tumour, unless the radical amputation of the penis is decided upon, cystotomy is to be preferred, as suprapubic drainage helps to prevent infection of the area under treatment.

Foreign Bodies in the Urethra.—Foreign bodies in the urethra are of diverse size and contour. Sea-

tangle tents, wax candles, hard paraffin, fencing wire, hairpins, hatpins, crochet-needles, rubber or metal tubes, catheters and beads have all been extracted from the urethra. The objective is to remove the foreign body with as little damage as possible. An article such as a hatpin always has the point outwards. If possible this should be bent into the form of a U before traction is applied. Sometimes the urethra can be protected from the rough surface of a foreign body by passing a rubber tube over it and into the urethra as far as possible before withdrawal. Again, it may be preferable to push the object into the bladder and remove it by cystotomy or crushing. If the urethra is likely to be damaged, perineal urethrotomy may be preferred, as articles such as wire may be divided and the two pieces withdrawn through the wound.

Urethral Stricture.—Although the incidence of urethral stricture is declining, it is still a very prevalent condition. The symptoms are well known to you and require no further comment. The ultimate cause of retention in such cases is œdema. Therefore every effort should be made to induce spontaneous evacuation of the bladder before instrumentation. The value of local anæsthesia for this purpose is well established. It alone may be sufficient to relax spasm and to permit voluntary micturition, but in any case it greatly facilitates the passage of instruments. The disadvantage is that the absence of pain renders instrumentation more dangerous in inexperienced hands. A sound or catheter of moderate size should be used first, for where there is much œdema but little fibrosis, the larger instrument will pass more easily. Whenever it fails, resort at once to the filiform bougies. Insert the first as far as the obstruction; then withdraw it half an inch and rotate it slightly. The angle at the tip causes the bougie to impinge on a different place, when it is again advanced so that repetition of the movement produces gentle tapping of the distal face of the stricture until the aperture is found, usually eccentrically placed nearer the floor of the urethra. In case the orifice is not located, insert a second bougie beside the first, and so on until one passes through the opening. Patience, gentleness and good instruments will succeed in practically every inflammatory stricture. Those of congenital or traumatic origin may include right angle kinks and require urethrotomy for their relief.

Acute Urethritis.—Acute urethritis also calls for antiphlogistic measures and will rarely require the use of a catheter.

Urethral Calculi.—Urethral calculi are in the same clinical category as foreign bodies. If the stone presents at the meatus, alligator forceps, perhaps aided by meatotomy, will remove it. If it has passed the external sphincter but cannot be induced to advance to the meatus by "milking", urethrotomy is indicated. When the stone is still within the posterior part of the urethra it may be displaced into the bladder by a sound in the urethra aided by a finger in the rectum. If that fails, urethrotomy or cystotomy is required. If the latter procedure is adopted, it is wise to pass a sound *per urethram* before commencing a search in the urethra. Otherwise the stone may be pushed further down the urethra and become inaccessible from above.

Inspissated Discharge at the External Urinary Meatus.—Inspissated discharge at the external urinary meatus is most often found in infants, but may also be present under a long or tight prepuce. The treatment is obvious.

External Pressure.—External pressure causing retention of urine may be the result of several conditions.

Pelvic and perineal tumours more often cause retention in the female than in the male. Should it be impossible to pass a catheter, try the effect of straightening the urethra by seizing the posterior part of the meatus and applying gentle traction. The catheter will then enter the bladder without obstruction.

Periurethral abscess or urethral diverticulum may exert sufficient pressure on the urethra to prevent micturition. As an abscess is most likely to be found proximal to a stricture, it should be thoroughly drained before instrumentation is attempted. Toxic absorption from a periurethral abscess under pressure proceeds rapidly, and you may soon find your patient dangerously ill.

Self applied obstructions. Various methods are used by patients to control discharge from the urethra or urinary incontinence. Amongst these may be mentioned the home-made "gonorrhœa bag", which is suspended by a tape tied round the penis, and wire or string loops used to control incontinence. These may lead to great œdema of the penis, with consequent tightening of the band until it becomes submerged in the swollen skin and subcutaneous tissue. The first step in dealing with these is to reduce the swelling. This is achieved by making longitudinal incisions through the skin only, allowing the escape of blood and serum, and suspending the penis with the glans upwards When the band can be seen, pass some flat object between it and the penis before dividing it. A pair of jeweller's pliers is a convenient instrument for dividing wire.

Carcinoma of the penis is the only tumour of the penis causing retention which has come under my notice. As irradiation by needling was in progress at the time, suprapubic cystotomy was performed immediately.

Retention without Organic Obstruction.

Intoxications.

Inflammatory Causes.—Typhoid fever, appendicitis, salpingitis *et cetera* and the onset of acute fevers in childhood may be accompanied by retention of urine. As a rule the patient is gravely ill, and intermittent catheterization is necessary to prevent further toxæmia. At the same time it should be remembered that bland urine is more easily passed than a highly concentrated, irritating urine. It is, therefore, advisable to push fluids to the limit of tolerance and to administer diuretics.

Chemical Causes.—Alcohol, arsenic, belladonna, ephedrin, lead and mercury have all been responsible for acute retention of urine. Withdrawal of the drug and the exhibition of an antidote should be followed

by catheterization. In some instances the effects will not disappear for many hours.

Endocrine Causes.—Recently a case has been recorded in which acute retention of urine occurred in association with latent tetany, the explanation offered being that the sympathetic nerve supply to the sphincter became over-active. Calcium was administered as a prophylactic measure after relief of the acute attack.

Retention of Nervous Origin.

Organic Lesions of the Central Nervous System.—The organic lesions of the central nervous system that must be considered are transverse myelitis and *tabes dorsalis*.

Dealing first with transverse myelitis, I must remind you that there is a great diversity of opinion regarding the management of retention of urine in spinal injuries. For the purposes of treatment these cases may be divided into four grades: (i) In some cases of spinal concussion the voluntary evacuation of normal urine takes place after a few hours. No treatment is required, but the possibility of gradually increasing residual urine should be kept in mind. (ii) If the distension is moderate but painless, manual compression of the bladder may evacuate a little urine. This should be repeated every four to six hours until "automatic micturition" is established, but it must be discontinued if it causes pain. (iii) If overflow incontinence is present it is generally painless. It is safe to wait up to thirty-six hours for the establishment of micturition, taking special care in the prevention of bedsores in the meantime. (iv) When manual compression has not been instituted early enough, when it is unsuccessful or causes pain, or when the size of the bladder causes intestinal symptoms, cystotomy should be advised. There is no place for catheterization in the treatment of retention due to spinal injuries. The majority of patients so treated develop a fatal urinary sepsis. Should the patient refuse operation, the surgeon may be compelled to resort to catheterization. Then some method of continuous drainage with intermittent irrigation, such as that of Cuthbert Dukes, is to be recommended.

In diseases affecting the spinal cord, such as *tabes dorsalis*, it may be permissible to use the catheter for the immediate relief of retention, as complete or partial recovery may be anticipated in a proportion of cases. Sympathetic neurectomy and perurethral resection of the bladder neck have materially altered the prognosis of these diseases in recent years.

Organic Lesions of Peripheral Nerves.—Organic lesions of peripheral nerves are practically limited to operations and gunshot wounds in the region of the rectum and base of the bladder. As a rule some degree of recovery is to be expected. It is, therefore, advisable to establish catheter drainage with intermittent irrigation early.

Hysteria.—Hysteria is always mentioned in this connexion. I regard it as a rarity, as no case has hitherto come under my care. If such an unhappy event should occur I should treat the patient in the same manner as I should treat a patient with post-operative retention to be mentioned presently.

Idiopathic Atony of the Bladder.—Idiopathic atony of the bladder is a euphemism to express our inability to explain why the bladder muscle fails to contract. Certainly such cases are uncommon, and when they are encountered the patients have had retention for some years. Permanent cystostomy is the only alternative to overflow incontinence.

Reflex Spasm of the Sphincter.—Reflex spasm of the sphincter from a remote inflammatory or traumatic source includes most post-operative cases. In all probability the anæsthetic is more often responsible than the operation. The bladder may become unduly distended without the patient's being aware of it, especially after deep or prolonged anæsthesia. Further, a given operation performed under local or regional anæsthesia is less liable to be followed by retention than when a general anæsthetic is administered. On the contrary, it is well known that when the site of surgical intervention is in the region of the distribution of the sacred nerves difficulty with micturition is often experienced. The problem is when to catheterize the bladder. If persuasion and diuretics fail, the urine should be withdrawn when the patient first appreciates the discomfort, or when the bladder is palpably distended. The risk of infecting a patient with sterile urine by occasional careful catheterization is quite negligible. But an exacerbation of cystitis or urethritis is liable to occur in patients with septic urine. If the patient is unable to void after the first catheterization, the subcutaneous injection of one half of one cubic centimetre of ephedrin in 3% solution, repeated every half hour, for four doses, may establish micturition. If not, the method of Marion should be tried. The bladder is drained and twenty to thirty cubic centimetres of boricated glycerine are left in the bladder. It is important that pure neutral glycerine should be used, otherwise sloughing of the mucosa may occur.

Simple Overdistension.—Simple overdistension may be found in young people through the absence of opportunity to void urine when the desire arises. A sedative is generally all that is required, but severe pain may necessitate immediate catheterization.

Conclusion.

Pathology, the mechanism of obstruction, and the methods of investigation in obscure cases have been omitted owing to the limited time available, although they have considerable bearing on treatment.

It is not my intention to leave you with the impression that I think the methods described are the only correct methods. There are as many ways of managing retention of urine as there are of making soup. But, like soup, some are good and some are bad. A few forms of treatment have been condemned; others have been advocated; but the majority have not been mentioned.

The objective has been only to describe a simple but systematic method of attacking each individual case with the weapons which are available to you all.

SOME NOTES ON "EVIPAN" AND "EVIPAN SODIUM".

By A. G. Bennett, M.B., Ch.M.,
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During the few years that "Evipan Sodium" intravenous anæsthesia has been available to the medical profession, its popularity has been phenomenal, and most anæsthetists are well versed in its uses. As very little literature has appeared on the subject, a short communication regarding some of its features may be of interest. Its remarkable relaxing effects on the tone of muscles is the main theme hereunder.

After using "Evipan Sodium" intravenous anæsthesia scores of times, this relaxing effect appears to me to be one of the constant phenomena associated with adequate dosage of this drug. While the intravenous injection is being given, and soon after the stage of surgical anæsthesia is entered, the patient's jaw falls back, the limbs flop loosely, the abdomen becomes very soft, and the sphincters are loose. In other respects "Evipan" may be quite varied in its reactions in different persons. For instance, dosage varies considerably in persons of the same weight *et cetera*, and emotional reactions while the patients are coming out of anæsthesia are most varied. Many are somnolent; some laugh; some cry; some sing; some fight and struggle. One man would roll himself over about fifty times. Most patients consider it extremely pleasant, in spite of such emotional reactions. Some have varied dreams to describe.

Of great value from the surgeon's viewpoint is the muscular relaxation. This is a constant feature, when the patient is well into the surgical anæsthesia stage, but it occurs before the patient is at all "deep" as judged from other signs, such as the state of pulse, colour and even respiration. This relaxation is of short duration, of course, like the anæsthesia itself, but is very valuable. Let me mention examples of this.

When, with a good "Evipan Sodium" anæsthesia, the uterus is curetted, the perineal muscles are so lax that the speculum fairly falls into position; the cervix is lax, and is easily dilated. The amount of hæmorrhage with "Evipan" is negligible compared to the corresponding operation under ether. Pituitrin is given towards the completion of the operation. A good "Evipan" anæsthetic makes curettage indeed a simple matter. This diminished bleeding at an operation is another feature with "Evipan", and is certainly due to a reduced blood pressure. The average fall in systolic blood pressure during anæsthesia is 20 to 30 millimetres of mercury. The diminished bleeding, however, is certainly pleasing to the operator.

In "Evipan" anæsthesia for dental operations hæmorrhage is one-quarter that associated with the volatile anæsthetics. Against this, however, on very rare occasions (one out of about fifty dental anæsthetics in my series) cases of secondary hæmorrhage after "Evipan" anæsthesia appear, and are due to a return of a higher blood pressure. Better jaw relaxation is noted for dental operations.

In nasal work, such as the radical antrum operation, middle turbinotomies *et cetera*, "Evipan" used before ether is given by the machine makes the introduction of the intratracheal catheter simpler; this is a result of the relaxation of the jaw and throat muscles. It makes the introduction of a post-nasal plug easier for similar reasons, and hæmorrhage appears to be less in nasal operations.

Case I.—Mrs. C. was suffering from profuse intractable epistaxis, associated with pregnancy toxæmia and high blood pressure. She had required morphine, veratrone, eliminative treatment and nasal packing continually for five days, and appalling bleeding continued from all of her nasal mucosæ and even from spots in the throat. She was given "Evipan" anæsthesia, and labour was induced mechanically. At the same time the packing was removed from the nasal cavities and a temporary post-nasal plug was fitted by the catheter method. From the time of the induction of this anæsthesia no further hæmorrhage occurred, the child being born normally about seven hours after the anæsthetic was given.

"Evipan" (hypnotic) tablets, in contradistinction to the more soluble and rapidly moving sodium salt, are found to be of great value for this relaxing effect.

For example, a child, given one-half an "Evipan" tablet by mouth half an hour prior to tonsillectomy under kelene-ether sequence anæsthesia, will be found to be much less apprehensive, to have a much smoother anæsthesia, and to take a smaller amount of ether than would otherwise be required. But the great value of the "Evipan" tablet thus given prior to tonsillectomy is the relaxing effect on the throat, allowing the tonsil to be easily fed through the guillotine, and not tending to be dragged out by a spasm of the throat. This is a common cause of missing one pole of a tonsil when an operation is performed under ordinary ether anæsthesia, especially when the anæsthesia is too light.

One and a half or two "Evipan" tablets, given by mouth half an hour before an injection for piles is given, will be found to have lessened both anal sphincteric spasm and the patient's apprehension. After all, for most of such cases the insertion of the speculum is practically the only discomfort associated with the procedure, and that mostly in apprehensive patients who have spasm and who do not bear down relaxingly. Patients so prepared sometimes sleep, but the duration is very short. Before sigmoidoscopy, morphine, hyoscine and "Evipan" (or any barbiturate) make the sigmoidoscope more comfortable for the patient, but even with "Evipan" tablets alone, relaxation of the anal sphincters is good. Also the involuntary musculature of the bowel appears lax, and can be inflated more easily than without such tablets.

Its use before a difficult vaginal examination in a young woman who has a spasm, makes successful examination possible; sometimes it obviates an

anæsthetic. Incidentally, "Sodium Evipan" gives the ideal anæsthesia for such examination.

To continue about the use of "Evipan" tablets. Before minor eye operations, such as removal of a pterygium, in nervous subjects the lessening of blepharospasm is noted. This means the lessening of the only discomfort that the patient notes in these operations, that is, the drag of the speculum on the eyelids. In muscle operations for squint, such as advancement, one-half to one tablet of "Evipan", according to age, will give relaxation of the tendons, and will make the operation twice as easy as it would otherwise be. Two child patients of mine went to sleep on the table while advancement operations were in progress.

For those who have not often administered "Evipan" anæsthesia, some useful points are as follow:

1. A speck of local anæsthetic, given intradermally with a fine needle over the vein, obviates the objection raised by a very few that the intravenous needle prick hurts, and it allows the latter to be more deliberate.

2. It does not pay to give an "Evipan Sodium" injection too rapidly into the vein, or a disconcerting apnœa occurs (which apparently needs a considerable rise of carbon dioxide in the blood before it passes off). If the injection is given slowly and the patient is watched carefully, the drug undoubtedly appears to be as safe as any anæsthetic, including gas.

3. The rule for dosage is to note how many cubic centimetres are needed to put the patient to sleep, for example two or three (average three). Then give an additional equal amount if a short period of anæsthesia is required, or give two additional equal amounts if a longer period of anæsthesia is required. Of course, not more than twenty minutes or half an hour of anæsthesia can be expected from one injection, unless it is supplemented by another injection or by ether or gas. The common-sense indications for dosage also apply, that is, the state of the patient's vitality, liver, excretory organs, age *et cetera*.

One frail old lady of seventy-two years had perfect anæsthesia with a dose of two cubic centimetres of the 10% solution, while a large, vigorous young man was given twenty cubic centimetres, which had no effect except that it acted as premedication for a volatile anæsthetic. As a matter of fact, ether given by the open method failed totally to keep this man anæsthetized, and chloroform given heavily was the only thing that would keep him anæsthetized. On theoretical grounds, chloroform following "Evipan" would appear to be dangerous, but in practice it appears to cause no concern.

4. Patients are best nursed on their side after "Evipan" anæsthesia, because the tongue and jaw tend to fall back and also because the freedom of airway and respiration need to be watched. It is the respiratory centre which is most depressed by "Evipan". For this latter reason it is wise to avoid morphine premedication with "Evipan" if possible, or, at most, to give only small doses, for example, half the usual doses of morphine, and to give atropine.

Giving medium doses of "Evipan" seems to be of very little consequence to the heart. In fact, clinically one gets the impression that the heart works more easily under the anæsthesia than before; this is due to the lower blood pressure. During anæsthesia the pulse is usually excellent from start to finish. Theoretically the heart is not so strong when it is obviously not receiving as much oxygen by coronary circulation, but practically, under medium "Evipan" anæsthesia, the heart gives us no worry at all. The following case note demonstrates this:

CASE II.—Miss D., fourteen years of age, had a temperature of 40° C. (104° F.) and septic cellulitis in the region of the left knee, with huge pus collections from 7·5 centimetres (three inches) below the knee and burrowing mainly subcutaneously in the thigh on three sides to the level of the greater trochanter. There were 75 centimetres (two feet six inches) of pus tracks. The patient was extremely "toxic". The pulse rate was 165 and it was very thready. The patient had periodic attacks of cyanosis. The heart was dilated to the anterior axillary line, and upward cardiac dilatation was noted about the third and fourth left interspaces. The patient was extremely nervous; she screamed when the leg was being examined, and did not want any doctor near her, and so on. With the parent's consent, "Evipan" was given (with the preliminary intradermal speck of local anæsthetic over the vein), and ten incisions were made in the thigh, the pus tracks being explored with the gloved finger. Other than one further slight cyanotic attack that night, the patient has made an uninterrupted recovery.

It is considered that almost any other type of anæsthesia would have resulted in heart failure in this case. A low spinal anæsthesia was considered, but the mental state and cardiac condition of the patient precluded this.

Some Disadvantages.

1. One disadvantage is the fact that some patients move the arm while the injection is being given and cause the needle to slip out of the vein, necessitating the finding of a vein, say, on the other arm to complete the injection. Of course, Dickson Wright's splint for use in "Evipan" anæsthesia may obviate this (see Hamilton Bailey's "Emergency Surgery", page 23), but it makes rather an ominous procedure of it from the patient's point of view.

2. The accidental spill of "Evipan Sodium" into the subcutaneous tissues around the vein appears to me to be a possible annoyance in the giving of the drug. It does not cause any slough or tissue damage. But for example, suppose that in a very young or small or frail patient, say, five or six cubic centimetres were given intravenously and then the needle slipped out of the vein and two or three cubic centimetres were given hypodermically before this was realized. Then suppose extra "Evipan" were given into the other arm, or that ether anæs-

thesia had to be continued, the hypodermic "Evipan" would still be absorbed, giving more effect than desired.

Antidotes.

Strychnine, given intravenously, has been extolled as being the best antidote. Lobeline hydrochloride is indicated. The newer group of analeptic drugs appears to be almost ideal as antidotes for "Evipan", namely, "Cardiazol", "Cardatone", "Coramine" and "Icoral", especially the last mentioned.

CASE III.—A small excitable Japanese patient of 44 kilograms (seven stone) weight took six cubic centimetres of "Evipan" to bring him to the surgical stage of anæsthesia. He was very "toxic" from a large abscess and pyorrhœa, and he was over long coming out of the anæsthesia. Breathing was very slow, about fourteen to the minute. The systolic blood pressure was only 68 and the diastolic pressure 55 millimetres of mercury. Even the pulse was a little slowed, 68 to the minute. At the same time, the quality of the pulse and the colour were moderately good. One cubic centimetre of "Icoral", given intramuscularly, within eight minutes increased the systolic blood pressure to 85 and the diastolic pressure to 58 millimetres of mercury. It also increased the pulse rate to 82; it produced a fullness of the veins and a stronger pulse. It obviously stimulated the nervous system, so that the patient began to move and to wake up more rapidly than he would have done without the "Icoral".

The following experimental observation was made. A kitten, weight 0·45 kilogram (one pound) only, was given a huge dose, two cubic centimetres, of "Evipan" *per rectum*. It rapidly became unconscious; and within fifteen minutes it had almost ceased to breathe, although its heart was still acting vigorously. Respirations would occur only once in ten seconds or more. Then a few minims of "Icoral" were given under the mucous membrane of the tongue. The effect was dramatic, respirations being increased almost to a normal sleeping rate. The two minims of "Icoral" were repeated one to two hours later, and, after sleeping until the next day, the kitten then made an uninterrupted recovery, except for being slightly wobbly in the legs for a few hours.

I estimate cats to have three to four times the resistance to narcotics, hypnotics *et cetera* per kilogram of body weight that human beings display; and by the doses required of such drugs as "Avertin" *per rectum*, I estimate kittens to have more, even nine to twelve times the human resistance. But even allowing for that, the recovery of this kitten points to a good margin of safety with "Evipan".

Conclusion.

"Evipan" in well estimated doses, and carefully administered, appears to be exceedingly safe. Great advantages to the surgeon accrue from relaxed musculature and lessened bleeding. "Evipan"-ether sequence has these advantages to a lesser degree; but it is even safer owing to the stimulating effect on respiration by the ether and owing to the fact that the dose of preliminary "Evipan" can be low, and yet it still makes the "entrance and exit" of the ether anæsthesia more pleasant for the patient.

Reports of Cases.

ARTERIAL EMBOLECTOMY.

By L. S. WOODS, M.B., B.S. (Melbourne),
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WHEN an embolus lodges in a peripheral artery and completely blocks the flow of blood it is a general rule that more or less of the extremity beyond the embolus becomes gangrenous. Within a few hours the lodgement of the clot usually starts a secondary thrombosis, which spreads distally and interferes with the collateral circulation. Simple ligature of the artery at the same site, on the other hand, does not necessarily lead to the same death of tissue in the extremity, because the collateral circulation is not disturbed and the blood supply is maintained.

The operation for removal of the clot to restore the circulation of the blood, arterial embolectomy as it is termed, was placed upon a sound basis in 1922, mainly through the Swedish surgical school, led by Einar Key,[1] of Stockholm.

In 1925, G. Jefferson[2][3] reported the first successful embolectomy in England, and in 1934 he reported his results in a further series of five cases.

Since 1922 the number of cases reported has greatly increased, for Max Danzis[4] mentions 129 cases in a detailed analysis of all cases reported during the period 1922-1932, and in 1933 H. B. Pearse[5] reported on 296 cases.

The operation is one of grave urgency, in which intervention is called for as early as in the more common abdominal catastrophes. Immediate arteriotomy, removal of the clot and suture of the vessel will, if successful, restore the circulation and gangrene is averted.

Clinical History.

On June 4, 1936, Mrs. W., aged seventy-three years, came under my care, suffering from mitral valve disease with auricular fibrillation, dyspnœa, and some œdema of the legs. Two years previously she had responded well to digitalis therapy, when she was suffering from auricular fibrillation with mild signs of cardiac decompensation. She was ordered large doses of digitalis and insisted on returning home to the country rather than stay in hospital for treatment.

Four days later she reported and her condition had greatly improved, but the fibrillation was still present.

On June 9, at 9 p.m., a telephone message from the country told me that she had developed a sudden pain in the right forearm and hand, and that they both appeared to be paralysed. On arrival in hospital at 12.30 a.m. she was complaining that the pain was steadily getting worse and that she had no power in the hand or wrist.

On examination the hand and forearm were pale and cold, the finger tips blue, and movements of the wrist and fingers caused intense pain. Sensation at the wrist and over the hand was impaired. Pulsation could not be detected at the wrist or in the hand. The brachial artery could be felt in the lower third of the arm, but the pulsation ceased in the antecubital fossa. A diagnosis of embolism of the brachial artery at its bifurcation in the antecubital fossa was made and operation was advised.

Morphine sulphate, 0·01 gramme (one-sixth of a grain), was given for the pain, and at 1 a.m., about six hours after development of the embolism, the operation was commenced, local anæsthesia by infiltration being used. A longitudinal incision about 12·5 centimetres (five inches) in length was made over the antecubital fossa and the brachial artery and the upper ends of the radial and ulnar arteries were exposed. The brachial artery was pulsating 2·5 centimetres (one inch) above the bifurcation, and below this point a doughy thickening within

the lumen could be felt. Below this mass there was complete absence of pulsation in the radial and ulnar arteries, which were apparently contracted and empty.

Clamps were improvised by covering the blades of the artery forceps with rubber tubing, and the brachial artery was clamped about 5·0 centimetres (two inches) above the bifurcation and the radial and ulnar arteries were each clamped about 5·0 centimetres (two inches) below the bifurcation. A longitudinal incision about 2·5 centimetres (one inch) in length was made just over the upper part of the clot, in the wall of the brachial artery, and by gently milking the radial and ulnar arteries towards the bifurcation the clot was extruded through the incision and removed. The upper clamp was released momentarily and blood spurted out, and the temporary release of the lower two clamps resulted in a gentle flow of blood.

The wound in the artery was then closed by fine silk, Number 000, on a fine needle, Number 16. The silk and the needles were sterilized in liquid paraffin, which fluid was used continually to drench the operating field. Sodium citrate, 2%, is favoured by most authorities as an anticoagulating fluid, especially as the paraffin has the disadvantage of making all the instruments slippery and difficult to handle. Five mattress sutures of silk were inserted. The lower clamps were released first to avoid strain on the suture line, and on release of the upper clamp the suture line was found to be water-tight. The clamps were then removed and the wound was closed.

Immediately the clamps were removed, the operating field, hitherto free from bleeding, filled with blood from veins which were injured earlier in the operation and had not bled. The radial artery was felt very strongly at the wrist, but the pulsation became less soon after the return of the patient to the ward. After a few hours it ceased entirely, but the colour of the hand had returned almost to normal. The patient slept throughout the operation and felt great relief from pain when she was questioned afterwards in the ward.

Twenty-four hours later the hand was warm, sensation was normal and the colour was good, except in the tip of the thumb, which was cold and blue. The radial artery was not pulsating, but pulsation could be felt in the ulnar artery.

For the next two days the local condition remained the same, except that the two phalanges of the thumb were definitely gangrenous. She complained of a good deal of pain as a result of this.

The patient's general condition had apparently improved since her admission to hospital, although her urinary output was low and her urine was almost solid with albumin. On June 14 she became drowsy and comatose and finally died eighteen hours later. An autopsy was not obtained.

Comment.

It is difficult to assess fairly the local result of the operation had the patient survived her general disease. At least she would have lost her thumb. Without embolectomy a forearm amputation might have been necessary, for an embolus at this site, by blocking the collateral circulation, causes a severe circulatory disturbance, and the whole hand may have become gangrenous. An amputation of the forearm in a cardio-vascular patient of her age would be a severe surgical test.

Jefferson states that most of the subjects are sufferers from heart disease with some form of myocardial damage and auricular stasis with unsuspected clot formation. They stand the relatively benign operation very well. A small number of cases occur as post-operative disasters in hospitals, and this group has the best chance of recovery, for obvious reasons. Such a patient, giving a history of sudden cramp-like pain, pallor, paralysis, with absent pulsation in the vessels of a limb, presents the clinical picture.

Early diagnosis is of paramount importance, if operative treatment is to be of real service. If left untreated, the majority of peripheral embolisms end in amputation, usually at a high level. Even an incompletely successful operation may have the advantage of making amputation possible at a lower level than would have been otherwise necessary.

Jefferson also points out that in the early cases the patients do well, and this for very definite and precise reasons. The lodgement of a clot sets up two things, which will in a few hours militate against a successful issue. First, endothelial changes, which cause a fresh thrombosis after the clot has once been removed; and, secondly, a thrombosis slowly spreads from the original clot and may assume such dimensions as to make complete removal impossible.

Within the first five or six hours these untoward effects are not likely to menace seriously the result, but after ten hours they become increasingly threatening, so that at the end of twenty-four hours operation will usually be hopeless.

A. A. Zierold[6] reports a series of cases, in two of which the circulation was restored after thirty-six and seventy-two hours respectively.

Emboli usually lodge at bifurcations, because the arterial lumen narrows just before a large branch is given off. The common sites are the femoral artery in the thigh, and where this artery passes through the adductor muscle to enter the popliteal space, the bifurcation of the aorta, the subclavian artery, the third part of the axillary artery and the brachial bifurcation.

Some authorities recommend arteriectomy, that is, complete excision of the obstructed segment of the vessel, and claim good results.

A. Gosset, I. Bertrand and J. Patel[7] summarize the advantages of arteriectomy over embolectomy as follows: (i) The operation is easy to perform. (ii) There is no need for special surgical precautions. (iii) Compression of the artery is not necessary, one cause of intravascular clotting or focus of abnormal vasomotor stimulation being therefore eliminated. In conclusion, these authors state that embolectomy is indicated in cases in which the embolus has lodged at the bifurcation of the aorta, external iliac arteries or similar large arteries.

Arteriectomy is indicated in: (i) cases in which it is necessary to act quickly, because of the patient's poor general condition; (ii) cases of embolectomy in which the endothelium of the artery appears greatly altered after the embolus has been removed; (iii) cases in which local changes make proper suturing of the artery questionable; (iv) cases of impending gangrene of the extremity, in which embolectomy has failed to give relief.

As far as could be ascertained, no previous record of a case of arterial embolectomy has been published in this journal. For this reason, and on account of its general surgical interest, this case and a few notes taken from the literature on the subject have been given. They show that this operation, in most cases, is one of relative ease, and that, although the mortality will be high, embolectomy is a justifiable procedure, well worth considering when a patient has a recent embolus which may cause eventual destruction of the whole or part of an extremity.

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(7) A. Gosset, I. Bertrand and J. Patel: *"Le traitement des embolies artérielles des membres"*, *Journal de Chirurgie*, Volume XLI, January, 1933, page 1 (abstracted in *Surgery, Gynecology and Obstetrics*, August, 1933).

Reviews.

LIGHT RADIATION IN DISEASE.

IT is a mark of progress in medicine that a manual dealing with a particular method of treatment should attain to a third edition in three years. There has been constant advance in the use of ultra-violet and infra-red radiation towards the alleviation or cure of disease. This makes it essential that "Actinotherapy Technique", a book published by the Sollux Publishing Company, should continue to enlarge if it is to keep abreast with the increasing knowledge of the powerful remedies with which it is concerned. The third edition deals with its subject in a comprehensive manner.[1] To this Sir Henry Gauvain, a recognized authority on actinotherapy, alludes in the foreword. "With the aid of this book the practitioner, with the requisite apparatus, has at hand, in a convenient form, an aid to special technique in treatment which is practical, illuminating and helpful." As has been pointed out on other occasions, the purpose of physical therapy is not so much to stand alone as to combine with and aid other remedies. To this the compilers of "Actinotherapy Technique" allude in the following words: "It should be superfluous to point out that most ailments call for the use of the triad, which includes physiotherapy . . . with surgery and medicine." Having this in mind, with the realization that the use of light for some of the conditions for which it is advocated is still experimental, this book will prove of the greatest value to those using actinotherapy as part of their equipment. It contains a wealth of information on all that pertains to its subject, the most important part of its contents being the list of those conditions which actinotherapy is credited with benefiting. Here full references are made to the sources from which information has been obtained. This gives a solid basis to such information. It would, however, be wise, even at the risk of making the book bulkier, if mention were made of other remedies used in each case in conjunction with actinotherapy. This would allay the suspicions of those who still believe that actinotherapy is akin to that quackery which professes to cure a multitude of complaints with the one all-conquering specific, rather than an adjunct to other remedies, as it generally is.

A MARRIAGE MANUAL.

THE demand for such books as "A Marriage Manual: A Practical Guide to Sex and Marriage", by Dr. Hannah and Dr. Abraham Stone, is a curious and significant sign of the times.[2]

The information given in "A Marriage Manual" is comprehensive and clear; the style is dignified and reticent. The authors have to their credit a vast clinical experience, a point of view that is admirably adjusted to the modern ideas of sex relationships, and considerable knowledge of the literature of the subject. To other medical practitioners who are called upon to give advice in cases of sex disharmonies, the form and arrangement of their answers to some hundreds of questions are suggestive and helpful. The subjects include anatomy, physiology, ethics, morals, psychopathology and hygiene; and the earnest young couple who are supposed to be asking for all this information should certainly be satisfied by the end of the session.

But the dialogue form is not happy. The picture of a pair of lovers sitting and listening to a long and sometimes tedious exposition on all possible aspects of their future state is just a trifle ludicrous. Can one imagine Romeo and Juliet undergoing this conscientious preparation before adventuring? But then Juliet had the nurse, and probably an oral tradition that disappeared from England soon after Elizabethan times. "O, Brave New World", in which the *ars amoris* has been replaced by the scientific treatise!

This particular book is a good example of a type, well-intentioned and well-informed for the most part, that has come to be almost a best-seller within recent years. We wonder for whom they are intended. They are not for the poor; the poor would have little need or use for any of the information, except perhaps that on contraception, and unfortunately the methods are usually beyond their means. They are not for the rich, certainly; nor for the intellectual, who is familiar with the influence Krafft-Ebbing, Havelock Ellis, Freud, Jung and a host of others—perhaps even including Dr. Marie Stopes—have had on literature for the last thirty years. Possibly to that numerous body of intelligent, well-meaning people whose knowledge of life and literature is limited and upon whom the repressive puritan tradition has weighed most heavily, certain chapters of this book may bring consolation and a liberation from fear.

It is probably necessary in English-speaking countries to make this illogically rational appeal for a return to appreciation and confidence in the instinctive forces of human nature. One imagines that many of the problems would be incomprehensible to people of other races. As the French critic said of the ideas of the plays of Bernard Shaw: they were quite sound and sensible, but it was difficult to understand why all that vehemence and eloquence should go into the discussion of what, to the more realistic Latin mind at least, appeared self-evident.

SURGICAL ANATOMY.

THE third edition of Alexander Lee McGregor's "Synopsis of Surgical Anatomy" contains a large amount of material attractively condensed into some six hundred pages.[1] The contents are methodically arranged in sections and there are numerous small diagrams adding greatly to the quality of the reading matter.

The author has attempted to combine anatomy, surgery, embryology, histology and pathology, and in doing so has perhaps attempted too much. The anatomy is accurate, but incomplete; while some important surgical regions, such as those of the appendix, gall-bladder and thyreoid gland, are dealt with reasonably fully, the palmar spaces are only touched upon, while the tongue is neglected altogether.

The best part of the book is that on embryology and on the relationship to surgery of congenital errors, such as hare-lip, branchial cysts and derangement of rotation of the gut.

Dr. McGregor also touches on clinical surgery and anatomy of surgical procedures; there is an excellent little chapter on nerves and the index is uncommonly good.

While it is possible to find some faults in this book, it should prove of great value to senior students and practitioners. It is easy to read, contains a fund of knowledge, and illustrates the great link between anatomy and surgery.

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[1] "Actinotherapy Technique: An Outline of Indications and Methods for the Use of Modern Light Therapy", with foreword by Sir Henry Gauvain, M.D., M.Chir., F.R.C.S.; Third Edition; 1935. Slough: The Sollux Publishing Company. Crown 8vo, pp. 190.

[2] "A Marriage Manual: A Practical Guide-Book to Sex and Marriage", by H. M. Stone, M.D., and A. Stone, M.D.; English edition edited, and with an introduction by, Michael Fielding; 1936. London: Victor Gollancz Limited, in association with John Lane The Bodley Head. Demy 8vo, pp. 352, with illustrations. Price: 7s. 6d. net.

[1] "Synopsis of Surgical Anatomy", by Alexander Lee McGregor, M.Ch., F.R.C.S., with a foreword by Sir Harold J. Stiles, K.B.E., F.R.C.S.; Third Edition; 1936. Bristol: John Wright and Sons Limited; London: Simpkin Marshall Limited. Crown 8vo, pp. 681, with illustrations. Price: 17s. 6d. net.

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THE COMMONWEALTH X RAY AND RADIUM LABORATORY.

In the report of the seventh Australian Cancer Conference published in last week's issue mention was made of a review by Dr. C. E. Eddy of the activities of the Commonwealth X Ray and Radium Laboratory during the year 1935. No reference was made to an important ceremony that took place during the conference, when the laboratory was formally opened by Sir David Rivett, K.C.M.G., Chief Executive Officer of the Commonwealth Council for Scientific and Industrial Research, in the presence of the Chancellor of the University of Melbourne, delegates to the Cancer Conference and others. When the Commonwealth Government purchased a quantity of radium for use in the treatment of patients suffering from cancer and for research purposes, it became evident that some method of caring for the radium would have to be devised, that provision would have to be made for carrying out alterations in mounting and screenage, that problems in the use of radium would continually arise, and that research directed to their solution would have to be undertaken. In conjunction with the University of Melbourne, the Commonwealth Department of Health therefore established the Commonwealth Radium Laboratory. The reports of the successive cancer conferences show the wisdom of the undertaking and how useful the laboratory has been to workers in radium and to the public at large. As time went on it became clear that the radium worker was not alone in his problems, but that the radiologist was faced with difficulties in the scientific application of X rays to cancer, particularly in the determination of the quality of X rays produced by different deep therapy machines, the accurate measurement of dosage and the determination of dosage received by tumours situated at varying depths. The sixth Australian Cancer Conference considered this matter, and as a result of a resolution that it carried the Commonwealth Department of Health decided to extend the scope of the work of the laboratory. Again it had the cooperation of the University of Melbourne, and the Commonwealth X Ray and Radium Laboratory came into being. As stated in last week's issue, its staff was appointed in August, 1935, and useful work has been carried out ever since. Just before the seventh Cancer Conference met, increased accommodation was found for the laboratory, and the delegates attending the gathering were provided with technical demonstrations in both its radium and X ray branches.

Sir David Rivett, in a characteristic and impressive speech at the opening gathering, said that the objectives of the new laboratory were to put the use of radium and X ray therapy on a quantitative basis. Then, in words that called to mind another great scientist, he said: "When any line of study or of action begins to seek for itself a quantitative basis it is knocking at the door through which only accredited sciences may pass." He said that it was undoubtedly to the credit of Australia that a laboratory was to be opened which aimed at securing maximum scientific accuracy in the

application of X rays to the treatment of disease, and in the stabilization, standardization and improvement of the technique of using radio-active matter, but that there was not much reason for pride that the year of opening had been postponed until 1936. Here he paid a well-earned tribute to the dogged perseverance and determination of the Director-General of Health, of Professor Laby and of the "other enthusiasts" whose aims and ideals were receiving recognition that day, and but for whom the opening of the laboratory would have been further postponed. Every scientifically minded person in the Commonwealth will echo Sir David Rivett's sentiments. While he admitted that he was exaggerating, since empiricism was seldom so bad in practice as it sounded in description, Sir David Rivett asked whether a surgeon who attempted to remove a tumour with an ax would be acting much more strangely than a colleague who applied a beam of X rays of undetermined intensity and of mixed and unknown frequencies, or who inserted into the body a tube of radon of quite uncertain dosage, contained in a tube or screenage equivalent unknown in terms either of platinum or any other standard.

The future of the Commonwealth X Ray and Radium Laboratory is assured. Not only will its activities cover the ground already indicated, but it will also continue to safeguard the health of workers in X rays and radium. Another result of its activities will be the establishment of local physical services in the several States in connexion with radiotherapeutic institutions. Finally, we may expect that research will not be forgotten by Dr. Eddy and his associates. Sir David Rivett suggested that the biological effects of X rays might be outdistanced by neutron rays, and pointed out that for equal ionizing power they were perhaps ten times as effective biologically as X rays. This was, he said, a field yet scarcely entered by the clinician and physicist working as a team. In work such as this the new laboratory may possibly lead the way to the discovery of weapons more powerful than those at present available.

Current Comment.

ACTIVE IMMUNIZATION AGAINST SCARLET FEVER.

ONE difficulty about the more general adoption of active immunization against scarlet fever has been the requirement of three, four or even five injections of the toxin at intervals of a week or more, in addition to Dick tests of the degree of protection achieved. The Michigan Health Department, in June, 1926 (Reprint Number 51), advised injection of 500, 5,000 and 30,000 skin test doses, with an interval of two weeks between injections. Burroughs Wellcome and Company (1936) suggest 500, 2,000, 5,000, 25,000 skin test doses at intervals of one or preferably two weeks, the performance of a Dick test one or two weeks later, and, if any children still give a positive reaction, a fifth injection, this time of 50,000 skin test doses. Dr. Hilda Bull (THE MEDICAL JOURNAL OF AUSTRALIA, June 1, 1935) begins with 100 skin test doses and, if there is no reaction, follows this with 200, 500 and 1,000 at intervals of five to seven days. This is a formidable and tedious procedure, for example, for the active immunization of a school, especially when an epidemic is in progress and speed is the essence of the contract. Another difficulty has been occasioned by the reactions provoked by the injections. It is therefore interesting, if not entirely convincing, to read the account given by Urban Mann,[1] a German military surgeon, of how he cut short an epidemic of scarlet fever in the Rostock barracks by giving all the inmates one immunizing injection.

The barracks are old, ill-ventilated and crowded. In January, 1935, when the scarlet fever epidemic began, there was already a rather severe epidemic of influenza in the barracks, and 452 men were in hospital on this account. Only about 6% to 7% of the men had previously had scarlet fever. For these reasons the population Mann had to deal with was very susceptible. At the onset of the epidemic an elaborate isolation of patients and contacts was instituted, but cases continued to occur. Active immunization of 178 contacts on February 3 did not check the epidemic, as cases occurred in all parts of the barracks. So on March 2 to 5 the entire population of the barracks, 1,582 in all, were injected. After this three cases occurred on March 12, 19 and 29, but no more. The protective injection material is described as "Behring", prepared from the original strains of Dick and Dochez; the dose was 1·0 cubic centimetre, given subcutaneously. At the injection site there was reaction after some hours, and by the end of two to three days an inflammatory redness and swelling about two to three centimetres in circumference. The constitutional disturbance was no more than after vaccination against smallpox. Of the men, 75% developed

[1] *Münchener Medizinische Wochenschrift*, January 31, 1936.

a scarlatiniform exanthem about the size of the palm of the hand, immediately surrounding the injection site. This lasted for one to two days, and after six to ten days desquamated typically. In three cases there was slight fat necrosis at the injection site, possibly because the injection had been given too deeply. There is no mention of any Dick test of the immunity produced by this one injection. It will be interesting to learn what exactly this "Behring" is. M. V. Veldee,[1] of the United States of America Public Health Service, detoxified with formalin a concentrated and purified toxin and gave injections of 0·1, 0·4 and 0·8 cubic centimetre with three week intervals.[1] There were only slight local reactions and no constitutional symptoms, and a month later he found that 80% to 90% of his subjects gave no reaction to the Dick test. It may be that Urban Mann's "Behring" was a toxoid similar to that of Veldee.

The Monthly Epidemiological Report of the League of Nations of August 15, 1929, gives statistics of active immunization against scarlet fever in Russia and in Eastern Europe, where it has been extensively practised. Some experimental work has been done with "formolized vaccine", "combined vaccine" (1,000 million hæmolytic streptococci and 2,000 skin test doses of toxin per cubic centimetre) and "toxoid", but in every case multiple injections were used. There is no mention of "one shot" immunization.

CHRONIC GASTRITIS.

SOME time ago reference was made in these pages to the recently introduced method of gastroscopy. An article on the classification of chronic gastritis has now been published by R. Schindler and M. Ortmayer, which is of interest since it embodies the results of further work by Schindler with the gastroscope.[2] It would seem that little will be hidden from the inquiring eye of the endoscopist in the near future, but it cannot be doubted that these very special and technical methods not only have their place in refined diagnostic work, but that they have added appreciably to our knowledge of the pathology of the living. Chronic gastritis is a subject of particular interest on account of its association with peptic ulcer and with disturbances of the blood-forming function, yet, although once it was a popular diagnosis, it lapsed into a period of neglect, when, as Schindler and Ortmayer remark, its very existence was denied. On a priori grounds we must agree with these authors when they state that inflammation of the mucosa of the stomach must surely be a common condition, when we remember how frequently inflammation occurs in other parts of the body.

Schindler and Ortmayer, after studying 1,200 cases with the perfected Wolf-Schindler gastroscope, offer convincing proof of the frequency of chronic gastritis, but admit that as yet no clear clinical picture has been established. Even the normal histology of the stomach is not quite standardized, owing to difficulties with fixation methods and traumatic alterations in biopsy specimens. It is apparent that great care must be exercised by the gastroscopist lest his enthusiasm leads him astray in labelling as pathological appearances found in normal persons. Schindler and Ortmayer point out that they do not include chronic benign ulcer in their description of gastritis, as in their opinion truly abnormal changes are not always seen in the neighbouring mucosa. To the usual subdivisions of hypertrophic and atrophic gastritis they add a superficial type. In this latter state the normally clear epithelium is seen to be cloudy and is often a deeper red or purple than the usual orange-red colour; erosions and œdematous areas and small hæmorrhagic zones may also be seen. In the atrophic form the mucosa becomes greyish green and is thinned out so that blood vessels may be visible through it. In the hypertrophic form the membrane is swollen and velvety, with abnormalities in the folds, making them appear broader and stiffer than usual; small nodes or warts are often noticed; and hæmorrhages and erosions are also seen. This latter type of gastritis is, in Schindler's opinion, very persistent and seldom allows the patient to regain complete health. The atrophic variety is less serious, inasmuch as it disturbs the patient's comfort less, but it may spread and assume a diffuse and intense form which carries with it an unsatisfactory prognosis. The superficial type is the most favourable and may resolve completely. Chemical and microscopic examinations of the stomach contents have not given comparable information to the authors, nor can radiological examination yield so complete a picture of the state of the mucosa, for there appears to be no true relation between the folds seen in relief on the screen and their actual thickness. The most striking conclusion arrived at after the survey of these 1,200 cases is that chronic gastritis is the commonest organic disease of the stomach. One cannot help wondering if the whole story is told by inspection of the lining of the stomach, and if, in spite of the obvious efforts made by these workers to be accurate and fair, they have not stressed this aspect unduly. They admit that a classification of gastritis cannot be made as yet on a basis of ætiology or symptomatology, which makes the position rather difficult. But nevertheless we must remember that large numbers of patients with digestive trouble are labelled as suffering from "functional dyspepsia" since no organic disease has been demonstrated. Can it be that amongst these are sufferers from a true chronic gastritis, unrecognized? The gastroscope may be as yet for the "highbrow" diagnostician, but it will indeed be strange if we do not learn a great deal from it.

[1] Rosenau: "Preventive Medicine and Hygiene", Sixth Edition, 1935, page 92.
[2] *Archives of Internal Medicine*, May, 1936.

Abstracts from Current Medical Literature.

DERMATOLOGY.

Treatment of Lupus Erythematosus with Gold Compounds.

Carroll S. Wright (*Archives of Dermatology and Syphilology*, March, 1936) discusses the value of the administration of gold compounds in the treatment of *lupus erythematosus*. The histories of 76 patients with *lupus erythematosus* who were treated with gold compounds, chiefly with gold and sodium thiosulphate, are reported. All the patients have been followed from the time of first observation to January, 1935. The histories of 27 additional patients to whom gold compounds were administered, but who were lost from observation, are not included in the statistical study. Twenty-eight patients, or 37%, are regarded as cured; 26, or 34%, were almost cured or were greatly improved; 13, or 17%, were improved moderately or slightly, and 9, or 12%, failed to respond favourably to treatment with gold compounds. Of the patients regarded as cured, two have been well, with no relapse for seven years, two for six years, two for five years, and three for four years. The amount of gold and sodium thiosulphate required for cure varies from a minimum of 12 milligrammes in one patient to a maximum of 2·75 milligrammes in another. Thirteen (17%) of the 76 patients suffered one or more relapses after being partially or entirely free from lesions. In some patients the lesions cleared again following further treatment with the drug; some were discouraged and refused further therapy. Nineteen (24%) of the patients suffered a reaction of one type or another from the gold. The commonest was a scarlatiniform dermatitis which occurred in eight instances. No fatality occurred in this series, except in one case (treatment in 1926), in which dissemination of the eruption and death occurred following the use of a foreign preparation of gold.

The Ætiology of Eczema.

At the fifteenth annual meeting of the British Association of Dermatology and Syphilology in July, 1935, J. M. H. MacLeod and I. Muende discussed the ætiology of eczema. Their views have now been set out in a condensed form (*The British Journal of Dermatology and Syphilis*, May, 1936). They believe that when an antigen, such as an external irritant or a foreign body, acts on the skin locally it causes the following changes, which constitute the eczematous reaction. First of all an epidermal release of a diffusible, non-specific substance (X substance) takes place. The X substance circulates and, if it is excessive, it causes fresh patches of dermatitis, but if it is slight in amount it simply causes sensitization of the skin. The X substance gives rise to irritation of the nerve endings and itching, and to stimulation of the basal cells with proliferation of the epidermis. The X substance has a chemotactic action on the underlying capillaries, causing dilatation, exudation of serum and a slight inflammatory infiltration. The authors regard these changes as the second line of defence of the skin to the antigen. These changes result in secondary epidermal changes, such as dilatation of the intercellular spaces, œdema and sponginess of the prickle cells and the formation of vesicles. When the antigen reaches the skin by way of the blood stream, it acts on the epidermis from beneath, causing itching and proliferation, and sets up analogous changes in the corium with the formation of more deeply seated vesicles. Examples of this type are the so-called neuritic eczema and gouty eczema.

A Dressing for Wounds Caused by Electrocoagulation.

L. Hollander (*Archives of Dermatology and Syphilology*, April, 1936) states that equal parts of balsam of Peru and castor oil make an efficacious dressing for wounds caused by electrocoagulation therapy for warts, nævi, senile keratoses and epitheliomata. Several layers of gauze should be saturated with the mixture and applied over the treated area; they should be covered with several layers of dry gauze and kept in place by adhesive tape. The dressing is changed every second day.

Fatality Following "Bismarsen" Therapy.

J. H. Swartz, M. M. Tolman and H. Levine (*Archives of Dermatology and Syphilology*, May, 1936) report a fatality following the use of "Bismarsen". The patient was a man, aged forty-seven years, who was referred to the dermatological clinic on account of a positive response to the Wassermann test, discovered in a routine medical examination. The patient had suffered for years from arterial hypertension. He was given a course of fourteen intramuscular injections of a bismuth preparation. He was then given intravenous injections of "Neoarsphenamine"; this was followed by some itching of the skin and a yellowish appearance of the sclerotics. He was then given tryparsamide. This was followed by "Bismarsen". After the third injection the patient became seriously ill and eventually died. At autopsy it was thought that subsequent microscopic examination would reveal toxic changes in the liver, but the fatty changes in the liver were not pronounced, there being only periportal lymphocytic infiltration and relatively insignificant infiltration of the liver cells of the central portion of the lobule. Extensive fat embolism of the lung was present and was regarded as explaining the fatal outcome. The authors point out that fat embolism may be of traumatic, metabolic or toxic origin. Most of the drugs that have been reported as leading to the development of fat embolism have a notoriously toxic action on the liver. However, no relationship between the damage to the liver and the fat embolism has been established, and the *modus operandi* of these drugs in causing fat embolism is not known. The authors refer to two recent cases in which fatalities from fat embolism followed arsenic therapy. They believe, in common with other writers, that it is the arsphenamine radical common to "Bismarsen" and to the other arsenic compounds which is responsible for the untoward reactions occurring during treatment.

Darier-Roussy's Sarcoid.

E. R. Maloney and F. C. Combes (*Archives of Dermatology and Syphilology*, April, 1936) state that Boeck originally applied the name sarcoid to a nodular eruption, which he held to be unique and easily differentiated from other granulomata and neoplasms. Kaposi applied the name loosely to include *mycosis fungoides*, the leuchæmias, *sarcomatosis cutis* and hæmorrhagic and melanotic sarcomata. Darier and Roussy described sarcoid of the hypoderm, affecting the adipose tissue, and differentiated it from the Boeck type, which affected the corium. They considered both processes to be tuberculous. The authors hold that Darier and Roussy's evidence was hypothetical and inconclusive. They have investigated the evidence and draw two conclusions. In the first place the Darier-Roussy sarcoid is a tuberculous granuloma of the skin, caused by the actual presence of the tubercle bacillus at the site of the lesion. It may give rise to systemic or other cutaneous tuberculous lesions. In the second place there is a benign granuloma of the skin with a tuberculoid structure which is often histologically indistinguishable from the Darier-Roussy sarcoid. This has many possible causes and has the following characteristics: (*a*) there is no evidence of tuberculosis elsewhere in the organism; (*b*) the histological picture is one of a tuberculoid nature with the process essentially in the hypoderm; (*c*) no tubercle bacilli are to be found, either in sections or on inoculation of animals; (*d*) There is no reaction to the tuberculin test; (*e*) the administration of arsenic produces a favourable response.

Pemphigus and Dermatitis Herpetiformis.

E. Urbach and S. Wolfram (*Archives of Dermatology and Syphilology*, May, 1936) have carried out experimental investigations on pemphigus and *dermatitis herpetiformis*. They find that rabbits inoculated with the blood serum and fluid from blisters of patients with *pemphigus vulgaris* and *dermatitis herpetiformis* exhibit a characteristic clinical and anatomical picture. A similar disease is manifested by animals receiving

injections of filtrates of the skin, mucous membranes, spleens and lymph glands removed at autopsy from patients dead of pemphigus. Attempts at transmission of the infection from human beings to animals and its passage through animals were repeatedly successful. The many successful transfers made with filtrates of fluids from blisters, blood serum and brain tissue point to an invisible filtrable virus as the cause of these diseases. The authors describe experimental observations from which they conclude that *pemphigus vulgaris* and *dermatitis herpetiformis* are caused by one and the same virus; they represent different forms of the same disease.

UROLOGY.

Neuro-Surgery of the Urinary Tract.

ELMER HESS (*Urologic and Cutaneous Review*, March, 1936) reviews the position of neuro-surgery of the urinary tract, which is still to be regarded as experimental. Some statements he regards as clinically proved, and on these the rationale of his operations is based. (i) Concerning the kidney itself: (*a*) There is no secretory nerve supply to the kidney. (*b*) Renal function is entirely dependent on blood supply; therefore renal sympathectomy should, and actually does, prove useful in certain types of nephritis and anuria. (ii) Of the calyces, pelvis and upper two-thirds of the ureter, he states: (*a*) The sympathetic system is the sole nerve supply, its fibres being vasoconstrictor, motor and sensory. (*b*) There is an intrinsic nerve supply which is connected to, but not dependent upon, the extrinsic supply. (*c*) Peristalsis is influenced by the sympathetic. (*d*) When the ureter is completely dissociated from the sympathetic, normal peristalsis is maintained. (*e*) Normal peristalsis depends more on muscular tone than on intact nervous connexions. (*f*) Wharton's observation that sympathetic fibres reach the ureter throughout its entire length is confirmed by the author's clinical experience. He cannot concur in the usual teaching that a completely sectioned ureter can never regain normal peristaltic movement. The clinical application of these facts is: (i) Pain due to spasm of the papillary muscle or to overdistention of the renal pelvis without organic obstruction, provided the diagnosis is accurate, is relieved by physostigmine and by renal sympathectomy. (ii) In carefully selected cases of nephroptosis renal sympathectomy is entirely successful; nephropexy "is not indicated, is unphysiologic and unnecessary". (iii) Ureterolysis is to be practised whenever a stone is removed from the ureter and in cases of nephroptosis. The bladder innervation has certain established features: (*a*) The supply comes from the sympathetic and parasympathetic. (*b*) Painful sensations are transmitted by both systems, but principally by the sympathetic. (*c*) The blood supply of the lower part of the ureter, the bladder and vesical neck is controlled by the sympathetic, the fibres of which are mainly vasoconstrictor. (*d*) The parasympathetic is motor to the detrusor and inhibitory to the sphincter and trigone; the sympathetic is directly opposed to it. (*e*) The pudic nerve is sensory to the posterior urethra and motor to the external sphincter. In practice it is found that: (i) If desirable (for example, to heal an inflammatory condition) the blood supply of the bladder may be increased over a long period by presacral sympathectomy. (ii) In the male, vesical neck spasm with pain or the detrusor sensation of pain due to spasm or over-distension, or, in the female, painful sensations from ovaries, tubes or uterus due to inoperable conditions, may be relieved by the same operation. (iii) In cord injuries when there is retention with overflow, when the cord injury has ceased to progress, and when there is a tight vesical neck with normal renal function, presacral ganglionectomy will give relief.

The Drug Treatment of Neurogenic Bladder Dysfunction.

J. T. GUERNON, E. PALMER AND C. M. MCKENNA (*Journal of Urology*, May, 1936) advise the use of "Mercholyl" and "Gynergin" when the detrusor muscle is hypotonic. "Mercholyl" is acetyl β methyl choline chloride, a substance similar in action to acetylcholine, but it is not destroyed by tissue fluids and its action is more prolonged; in addition, it can be administered orally. Cystometrically the results of its exhibition are: (i) a rise in the involuntary intracystic pressure, (ii) lowering of the threshold of sensation, (iii) diminution of vesical capacity, and (iv) increased emptying pressure. Clinically, improvement is seen as: increased force and frequency of micturition; easier initiation of voiding; decreased vesical capacity; greater "desire to urinate"; better control, that is, less urgency; and decreased terminal dribbling. "Gynergin" is ergotamine tartrate, which is an inhibitor of sympathetic nerve endings. Its action is identical with but less pronounced than that of "Mercholyl". There may be some risk of poisoning by ergot, but it has been used for two to four weeks without untoward incident.

Treatment of Gonorrhœa.

R. S. GANEWSKAJA AND E. WERBATUS (*Monatsschrift für Geburtshülfe und Gynäkologie*, April, 1936) describe a new substance for the treatment of gonorrhœa in the female. It is a silver preparation in an ammoniacal solution, and because of the effect of light must be kept in dark containers. They consider that in acute uncomplicated cases the clinical and bacterological results are much better than those obtained with the usual remedies and also halve the duration of treatment. It is also of great use in those cases resistant to the usual drugs. No complications or after-effects have been observed, and it is particularly useful in ambulatory treatment. The methods employed are carefully described and the preparation has the advantage of being cheap and easily prepared.

Mandelic Acid and Ammonium Mandelate.

H. E. HOLLING AND R. PLATT (*The Lancet*, April 4, 1936) report on the results of twenty-five cases of urinary tract infections treated with sodium mandelate *plus* ammonium chloride. The latter drug acidifies the urine and causes a reaction by which mandelic acid appears in the urine. For proper action the acidity of the urine must reach a degree corresponding to a hydrogen ion content of 5·3 or lower. The dose of sodium mandelate is 3·43 grammes, four times a day. Four to eight capsules of one gramme of ammonium chloride are usually needed per day. In every uncomplicated case the urine was rendered sterile in two to twenty-one days. The medical attendant should be on guard against the appearance of casts or albumin in the urine; in such an event the ammonium chloride must be reduced. To obviate the necessity of two separate medicaments being given, ammonium mandelate has been tried. It was hoped that ammonium mandelate would both acidify the urine and act as bacteriostatic; and in the majority of cases this hope has been fulfilled. The authors have so far been able to report on only a few cases, but the results are excellent. When ammonium salts are taken by mouth the ammonium radical is converted into urea and excreted as such, leaving the other radical to be excreted as the acid of the salt exhibited. The dose of ammonium mandelate is the same as in the case of the sodium salt, that is, 3·43 grammes four times a day. Ammonium mandelate is very hygroscopic and therefore cannot be taken as tablets; nor does the crystalline salt keep well. The drug is therefore best kept for dispensing as a solution. The authors used an already flavoured elixir.

The Pathogenesis of Retention.

A. TRABUCCO (*Journal d'Urologie*, April, 1936), from a study of the musculature of the vesical trigone and internal meatus in 100 subjects, concludes that in order to allow of free and complete emptying of the bladder the lower lip of the internal meatus must be capable of liberal downward excursion (that is, in a rectal direction). So that this free excursion may occur, the "proper muscle of the bladder neck" must be in a healthy condition and unimpeded in its action by the presence of new-growths, fibrosis *et cetera*. In the resting condition the internal meatus is a horizontally disposed slit with upper and lower lips applied to each other by tonic contraction.

British Medical Association News.

SCIENTIFIC.

A MEETING of the New South Wales Branch of the British Medical Association was held at the Royal Prince Alfred Hospital, Camperdown, on June 4, 1936. The meeting took the form of a series of clinical demonstrations by the members of the honorary staff. Part of the report of this meeting was published in the issue of August 8, 1936.

Acute Mastoiditis.

DR. ASHLEIGH DAVY demonstrated three cases of acute mastoiditis.

Staphylococcal Septicæmia Complicating Acute Mastoiditis.

A girl, aged twelve years, had developed staphylococcal septicæmia nine days after operation for acute mastoiditis with perisinus abscess. She had a swinging temperature, as high as 40° C. (104° F.) and more, for the following ten weeks. For a large part of this time her general condition was very serious and on occasions critical. A hæmolytic *Staphylococcus aureus* was cultured both from the wound and the blood. There was no evidence of lateral sinus thrombosis. The patient was treated with repeated intramuscular injections of antistaphylococcal serum without any apparent benefit. Olive oil by mouth was given, but caused loss of appetite and nausea. Thirty cubic centimetres of 5% emulsion of olive oil were given intravenously with slight temporary benefit. Undoubted benefit was derived from blood transfusions, of which five were given at approximately twelve-day intervals; the amount given varied from 200 to 300 cubic centimetres. On two occasions one cubic centimetre of a vaccine prepared from the organisms was injected subcutaneously into the donor six hours before his blood was taken (one cubic centimetre of vaccine contained approximately 2,000,000,000 organisms). Following the last transfusion, which was given a little over four weeks before the meeting, the high temperature gradually subsided. About this time a small swelling appeared over the coccyx and was incised when fluctuant two days later. Seven cubic centimetres (two drachms) of thick pus were evacuated and yielded *Staphylococcus aureus* and hæmolytic streptococci on culture. The temperature became normal twelve weeks after the operation and the general condition then improved rapidly. The patient was discharged from the hospital one week before the meeting. At the time of the meeting the patient was putting on weight rapidly. The wound was clean and was granulating slowly. The tympanic membrane had healed and the hearing was practically normal. Dr. Davy expressed his thanks to Dr. Halloran, Dr. Storey, Dr. Poate and Dr. Collins, who had seen the patient in consultation, and to Dr. E. Thomson, under whose supervision the blood transfusions were carried out.

Points to be noted in the case were that: (i) The blood infection had occurred, almost certainly, via small veins emptying into the lateral sinus, but without sinus thrombosis. As there was no signs of sinus thrombosis the internal jugular vein was not tied. (ii) Considerable benefit was derived from repeated blood transfusions, two of which were immuno-transfusions.

A Perisinus Abscess of Unusual Size.

A woman, aged forty-six years, had been operated on the day she was admitted to hospital, five weeks after the onset of aural suppuration. She was found to have a perisinus abscess of extraordinary size, extending from the upper genu of the sinus throughout its entire course, apparently right to the jugular bulb. The X ray picture of this patient taken prior to the operation showed an unusual degree of bony destruction. This was confirmed at the operation. Almost all the mastoid cells were invaded and broken down and yet no invasion of the lateral sinus had taken place. The patient was making an uninterrupted recovery. The case was of interest in that it demonstrated the extraordinary resistance of the dura to an infection which had caused breaking down of all the surrounding bone.

Conservative Treatment of Acute Mastoiditis for Nine Days Awaiting Optimum Time for Operation, with Closure of the Wound.

The third case was that of a woman, aged twenty-three years, who was admitted to hospital four days after the onset of aural suppuration. Her temperature was 37·8° C. (100° F.). There was profuse purulent discharge, with œdema and extreme tenderness over the mastoid process. Constitutional disturbance was slight. It was decided that, although mastoiditis was undoubtedly present, conservative measures should be used for the time being in order to allow local tissue resistance to develop. Two days after admission to hospital the patient's temperature was nearly normal and did not rise above 37·3° C. (99·2° F.) for the following week. During this waiting period there had been very little constitutional disturbance, and the patient stated that, apart from some discomfort in the ear, she felt well. There was still slight œdema and tenderness over the mastoid, and the aural discharge was still very profuse. The postero-superior meatal wall showed some bulging downwards and forwards. At operation purulent mastoiditis was found to be present, pus being found in the antrum and its adjoining cells and in cells down to the tip of the mastoid. The lateral sinus and *dura mater* of the middle fossa were not exposed. In view of the almost normal temperature and the absence of constitutional disturbance or threatened complication it was decided to stitch up the upper four-fifths of the wound. A small drainage tube was inserted from the lower portion of the wound up to the antrum. The tube was gradually shortened and taken out altogether eleven days after the operation. At the time of the meeting, twenty days after the operation, the wound was healed, except at the extreme lower end where the tube had been inserted. The ear was practically dry. The operation on this patient was performed during what might be termed a latent period of mastoiditis. While great care was necessary when deciding on a waiting policy in such cases, the case quoted provided all the desiderata, namely: absence of constitutional disturbance or threatened complication, profuse aural discharge and a high temperature, which, after the first acute stage, rapidly settled down to nearly normal with conservative treatment.

It might be thought that these cases would clear up without operation; but the previous patient had, from her history, undoubtedly passed through this period of latent mastoiditis during the five weeks between onset and operation. The suppuration in that instance had been allowed to go on for too long. There appeared to be an optimum period for operation on mastoiditis, from towards the end of the second week to the end of the third week of the disease, and it was sometimes justifiable to postpone the operation until this period in the absence of threatened complication. In such cases it was sometimes possible to stitch up a greater part of the wound and insert a drainage tube for a few days, thus shortening convalescence and minimizing the discomfort.

Facial Deformity and Contractures after Nitric Acid Burns.

DR. R. A. MONEY showed a man who was suffering from facial deformity and contractures after nitric acid burns. He had been treated by plastic surgery and skin grafting. This case will be reported in detail, with a series of photographs, in a subsequent issue.

Deformity of the Nose and Upper Lip following Trauma.

Dr. Money showed a male, aged twenty years, who had fallen off a bicycle two years ago and cut his nose, upper lip and face. The wounds took about a month to heal, and after that he noticed the tip of his nose being drawn downwards. The patient had multiple scars on his forehead, nose, cheeks and both lips. The columella of the

nose had been destroyed and replaced by scar tissue, which had pulled the tip of his nose down to the upper lip and flattened out the nostrils. Dr. Money explained that it would be necessary to excise the scar, to reform the columella, and to cover it with a Blair's split-skin razor graft. The scar on his lower lip would need excision and resuture.

Cleft Palate and Hare Lip.

Dr. Money also showed a male, aged twelve years, who was seen in September, 1935, with a cleft palate involving both the hard and soft palates, and a hare lip, which had been repaired when he was an infant. The result was unsatisfactory, owing to irregularity of the red margin and flattening of the left nostril, with adhesions to the maxilla. No operation had ever been performed on the palate. The patient's speech was seriously affected and fluid sometimes regurgitated through his nose. The septum of his nose was deflected and he had a large pad of adenoids in his naso-pharynx.

Dr. James Woodburn removed the adenoids, but it was decided not to interfere with the septum at the present time. During the same anæsthesia the great palatine artery on each side was cut and the hamulus of each medial pterygoid lamina was fractured inwards. These procedures allowed a good collateral circulation to develop in the soft tissues of the palate, and also relaxed the tension in the *tensor veli palatini* muscles.

Two weeks later the palate was repaired by the modified Langenbeck method, the lateral incisions on each side being extended back along the pterygo-mandibular raphé; the soft parts were completely freed from the hard palate; the edges of the cleft were freshened and sutured with fine chromicized gut without any tension. The lateral areas were packed with gauze and allowed to granulate later. The palate healed by primary intention and the patient was discharged one week later to attend the speech reeducation school at the Children's Hospital.

Since operation the patient had improved in every way and he was now to be readmitted to hospital for plastic repair of his hare lip and flattened left nostril.

Cyst of the Right Side of the Pericardium and Mediastinum, Probably a Dermoid.

Dr. Money's next patient was a woman, aged thirty-nine years, who was admitted to hospital in August, 1935, complaining of shortness of breath for two years and of wheezing for two months. She also had some pain in both hypochondria. She had come to Australia from England in 1923 and had spent eight months in the Riverina on a sheep station. Physical examination revealed no abnormality except an inspiratory stridor, but X ray films showed a large rounded shadow in the right side of the mediastinum. Bronchoscopy yielded no information. Artificial pneumothorax was induced on the right side, and this relieved the wheeze. Thoracoscopy was then performed and a large rounded cystic tumour was seen arising from the right side of the pericardium, just below the root of the right lung, anterior to the pulmonary ligament. Operation was then performed and the tumour was exposed by opening into the right pleural cavity through an incision along the seventh intercostal space and by spreading the ribs apart. Ether was given by the intratracheal method. A large cyst was found, with partly calcified walls, embedded in the right side of the pericardium close to the right auricle and extending upwards among the great vessels. It was opened and a large quantity of greyish-yellow pultaceous material was evacuated. The lining of the cyst appeared smooth and no membrane was found, despite a pre-operative positive reaction to the Casoni test.

A small piece of the wall removed for biopsy showed only dense fibrous tissue with some small granules of calcification.

A tube was stitched into the cyst cavity and brought out anteriorly alongside the xiphisternum and allowed to drain into a bottle. A self-retaining catheter was inserted into the pleural cavity through the ninth interspace and a negative pressure was created to help the lung to expand. After a rather parlous convalescence the patient was discharged from hospital in February, 1936, with a small sinus draining slightly.

At the time of the meeting the sinus was practically closed; X ray examination of the chest and mediastinum revealed no abnormality, whilst the electrocardiogram was normal. Dr. Money said that the patient had been referred to him by Dr. A. J. Collins, who performed the artificial pneumothorax.

Multiple Fractures.

Dr. Money's last patient was a man, aged twenty-two years, who was injured by falling timber on August 12, 1935, and was admitted to hospital shortly afterwards in a shocked but conscious condition. On examination he was found to have sustained the following injuries: (i) Lacerations and abrasions of the right ear, the right side of his face and the right lower eyelid. Blood and cerebro-spinal fluid were trickling out of both ears. There was a paralysis of the facial nerve of the right side. (ii) A fracture of his right zygomatic bone involving the orbit. (iii) A compound fracture of the right maxilla, with separation medially of the alveolar portion carrying the three molar teeth. (iv) A compound comminuted fracture of the right side of his mandible and a compound fracture of the left side. (v) A Pott's fracture-dislocation of both bones of the right leg. (vi) A fracture of the first cuneiform bone of the right foot. (vii) A lacerated wound of the left middle finger.

When the patient had recovered from his shock the fragment of the maxilla containing the molar teeth was sutured back into position with catgut sutures and held there with a piece of wire fastened around the teeth and brought out through the cheek over the arch of the zygoma. The wounds of his face and ear were sutured and dressed with friar's balsam. The Pott's fracture-dislocation was satisfactorily reduced and placed in a plaster cast. The wounds of his face became septic and pus poured from his right maxilla into his mouth. Ten days later two secondary hæmorrhages occurred from the loose alveolar portion, and on August 29, 1935, this was removed and the floor of the antrum was remade from the gingival flaps. The remaining teeth of the upper jaws were then wired to the teeth of the mandible by the eyelet method of Ivy, in pairs, and allowed to remain in that position for three weeks. The result was entirely satisfactory; full movement of the lower jaw was regained, the wounds healed and the right side of the patient's face recovered its movement. The plaster cast of the right leg and ankle was removed six weeks after the injury and another cast was applied with a walking iron for a further six weeks. A good anatomical and functional result was thus obtained. Dr. Money pointed out that the patient had a good dental occlusion, there was no discharge from his right antrum, and his cosmetic appearance was unchanged.

Dr. Money said that he wished to acknowledge the helpful advice of Dr. E. Stanley Wallace.

Angio-Endothelioma.

DR. J. C. BELISARIO'S first case was one of angio-endothelioma occurring in a young female, aged twenty-six years, who had had recurring hæmorrhages on the left arm over original red birth-marks. Deep X ray therapy had been employed with temporary benefit, as well as diathermy to ulcerated granulomatous areas. Attention was drawn to the fact that a mixed staphylococcal antivirus had proved the best healing agent for the ulcerated areas. There was no reaction to the Wassermann test or to the Kline test. A section of the affected tissue under the microscope showed the surface epithelium to be absent or thinned. The underlying tissue showed numerous blood vessels supported by a fibrous stroma. Collections of large cells with large oval nuclei (endothelial cells) were present, in addition to a general heavy infiltration of inflammatory polymorphonuclear cells.

Tertiary Syphilitic Ulceration.

Dr. Belisario's second case was one of tertiary syphilitic ulceration of the legs occurring in a female, aged thirty-one years, who had had recurrent ulcers of the legs for

the previous thirteen years. No history of a previous rash or sore had been obtained, nor had the patient ever been pregnant. The ulcers showed the typical punched-out appearance in some areas, and granulomatous, sloughy, wash-leather bases in other areas. Pigmentation and superficial white scarring were also present. The Wassermann and Kline tests gave strongly positive reactions.

Lichen Planus.

The third case shown by Dr. Belisario was one of generalized *lichen planus* in a male, aged forty years, who complained of a very irritable rash which had appeared suddenly on the forearms and ankles six months previously. Lately it had spread to the body and mouth. The typical features of *lichen planus* were present, namely, flat-topped shiny papules, violaceous hue, accentuation of the normal lines of the skin and a predilection for the flexor surfaces of the limbs and lower abdomen. On the mucous membrane of the cheeks fine white criss-crossing striations were seen with larger dots at their points of intersection. The patient had proved intolerant to intravenous injections of mercury and to "Novarsenobenzol". He was at the time of the meeting receiving X radiation treatment over the spinal region. Lumbar puncture had not yet been employed.

Scleroderma.

Dr. Belisario also showed a case of circumscribed scleroderma occurring in a female patient, aged twenty-nine years, who complained of having received, twelve months previously, a bump on the right leg, which had left a small lump. This had gradually increased in size, and one month previously a reddish mark had appeared just below it. Two weeks previously another reddish mark had appeared on the left leg. Chilblain circulation and slight œdema of the legs were present. The largest lesion showed a reddish halo with central atrophy and a few dilated blood vessels; it gave a parchment-like sensation to the touch. The two newer reddish lesions demonstrated the primary erythema which often precedes the typical appearance of scleroderma. The treatment recommended was fractional doses of X rays.

Pyogenic Granuloma.

A case of pyogenic granuloma was then shown by Dr. Belisario. The patient was a male, aged forty-seven years, who complained of a sore which had appeared on the back of the left hand about six months previously. It first appeared as a small pimple, which broke down and spread peripherally, at times becoming purulent. The lesion was never tender, nor was there any history of previous injury. There was no reaction to the Wassermann and Kline tests. No evidence of tuberculosis, actinomycosis or other fungi was detected. On culture, a pure strain of hæmolytic streptococcus was obtained. This was of particular interest, as the organism commonly found in these lesions was the *Staphylococcus pyogenes aureus*. Microscopic examination of a section of the tissue supported the diagnosis. The affected area was circular, with a diameter of about 7·5 centimetres (three inches), showing a central, healed, somewhat atrophied area, and a peripheral, irregularly raised, nodulo-purulent arrangement with a more or less coral-reef appearance. The treatment employed was the administration of one and a half erythema doses of X rays through a one-millimetre aluminium filter. Dr. Belisario said that he was indebted to Dr. F. C. Florance for being permitted to show this case.

Tinea Tonsurans.

Dr. Belisario next showed two cases of *tinea tonsurans*, in a brother and sister, aged four and six years respectively. The brother was first affected seven months previously and the sister a fortnight later. Several circular erythemato-squamous patches were visible on both scalps, with some follicular pustulation. Snapped-off hair stumps were visible, varying from one-eighth to three-quarters of an inch in length, twisted and discoloured in appearance. Both patients had previously had circular lesions on the face and body, which were no longer present. The mother stated that a mangy dog came to the house just prior to the first outbreak on the boy's scalp. Hair stumps from the lesions displayed under the microscope showed the presence of a small-spored animal ringworm. The treatment recommended was 8·5 milligrammes of thallium acetate per kilogram of body weight, administered by mouth, or total epilation of the scalp by X radiation. Either method had to be accompanied by local anti-parasitic applications.

Acne Vulgaris.

Dr. Belisario then showed two cases of *acne vulgaris* occurring in young females. One patient was shown before the commencement of treatment, and attention was drawn to large nodulo-cystic lesions on the face and to the unlikelihood of benefit accruing from local applications, whether combined with internal medication or not. The treatment recommended was eight weekly applications of one-quarter of an erythema dose of X rays, preferably through a 0·3 millimetre filter of aluminium. The accompanying dandruff and the general health were to receive adequate attention. The second patient had already received five applications of one-quarter of an erythema dose of X rays at weekly intervals. Although prior to treatment the acne lesions on her face had been similar to those of the first patient, they were at this stage almost entirely gone, and with three doses of X rays still to be delivered, the prognosis was excellent. Attention was drawn to the irregular pigmentation which often accompanied this series of X ray applications and which rapidly subsided after the treatment was completed.

Basal-Celled Carcinomata.

Dr. Belisario next showed two cases of basal-celled carcinomata occurring in elderly males. One patient had a nodulo-cystic lesion situated at the left inner canthus. It had commenced twelve months previously as a wart and had increased lately in size. The lesion was freely movable, and the treatment recommended was the burial of three double one-milligramme radium needles in the form of a triangle around the edges of the lesion for a week. The second patient showed several basal-celled carcinomata, keratoses, healed treated areas, and a cutaneous horn, all situated on the face. One lesion on the right cheek had recently been treated by the implantation of three needles containing six millicuries of radon. The other lesions were to be treated with radium plaques.

Squamous-Celled Carcinomata.

Finally, Dr. Belisario showed two cases of squamous-celled carcinomata which occurred in private patients. The first, a male, aged sixty years, had been treated for carcinoma of the lower lip two years ago, and there was no sign of recurrence. The treatment had been given with a skin therapy X ray machine, the factors employed being 110 kilovolts, six milliampères, ten inches skin unit distance, 1,200 *r* units through a two-millimetre aluminium filter being delivered. A cross-fire of 600 *r* units from each side of the lip was employed. The second patient, a male, aged sixty-eight years, had a squamous-celled carcinoma of the back of the right hand, five centimetres (two inches) in diameter, situated over the second and third metacarpo-phalangeal joints. This patient had been treated six months previously with the same machine, and 1,500 *r* units had been delivered, right-angle cross-fire being employed. The area appeared to be entirely free of any remains of the original condition. Attention was drawn to the good results obtainable with a low kilovoltage X ray machine in these conditions.

Histidine Treatment of Peptic Ulcer.

DR. ERIC SUSMAN discussed results obtained from the treatment of peptic ulcer by histidine, basing his remarks upon the study of twenty-one successive patients admitted into the wards of Dr. A. S. Walker. These patients were all thought to be suffering from peptic ulceration of the stomach or duodenum, and had all been admitted to hospital between February and May, 1936. Six of the

twenty-one cases had been excluded from the series, since two were complicated by pulmonary tuberculosis, and in four no abnormality could be observed radiologically, although the symptoms were suggestive of ulcer. The remaining fifteen patients were treated by: (i) rest in bed for three weeks; (ii) alkaline powders, four grammes (one drachm) every two hours; (iii) a full diet, with the exclusion of vegetable roughage; and (iv) intramuscular injections of "Larostidin" in doses varying from 2·75 to 5·0 cubic centimetres twice a day for three weeks (5·0 cubic centimetres of "Larostidin" contain 0·2 gramme of histidine monochlorhydrate).

Dr. Susman said that the symptomatic ebb and flow of peptic ulceration was one of the most bewildering, paradoxical and tantalizing subjects in the whole realm of clinical medicine. Gain in weight, disappearance of occult blood, and cessation of alimentary and nervous symptoms were all fallacious criteria of cure. Cure involved two therapeutic problems: (i) to heal the lesion and (ii) to keep it healed.

After the treatment mentioned all fifteen patients said they were much better, including one or two "old hands" with a wealth of therapeutic disappointments behind them. Yet, in spite of this unanimous assurance, one patient's symptoms returned and another was back in hospital as a result of an alarming hæmatemesis which occurred only a fortnight after his "cure".

Discussing the radiological findings, Dr. Susman said that of the fifteen patients five were reported as having a crater; these five patients seemed to do well, and after one month the X ray picture appeared normal. The remaining ten patients had "a constant deformity", "filling defect", "irregularity with spasm", *et cetera*, of the stomach and duodenum. At the end of the injection treatment five of these ten patients were *in statu quo*, in two the condition had retrogressed, and in three the stomach and duodenum were said to be normal.

Dr. Susman said that in such a small series of cases, and after such a short period, the conclusions drawn were strictly tentative and should be regarded as clinical impressions rather than as established facts. With these qualifications his conclusions were as follow: (i) Histidine appeared to hasten the healing of the ulcer, particularly if it was large enough and deep enough to produce a crater. There was no evidence as yet that it kept the lesion healed. (ii) With the aid of histidine patients might be treated from the start on a full and liberal diet. The rigorous Sippy *régime* could be abandoned, the risks of alkalosis were diminished, and vitamin and iron deprivation were eliminated. (iii) In spite of the flimsy and unphysiological premises upon which it was based, histidine treatment appeared to be a definite advance in the management of the early case of peptic ulcer. The injections were painless, the cost was not prohibitive, and no harm was done to any patient in this series.

Ring Carcinoma of Sigmoid Colon.

DR. J. COLVIN STOREY showed a female patient, aged fifty-seven years, who had been admitted to hospital on March 18, 1936, complaining of constipation of one month's duration (it had been absolute for six days), as well as vomiting and pain in the stomach of five days' duration. The patient was given an enema on the morning of admission to hospital, and one the day before, with only slight result. She had passed no flatus for five days. This patient had had no previous operations.

On physical examination the tongue was found to be furred and the abdomen very distended, but there was no tenderness or palpable mass. On auscultation a splashing sound was heard in the right flank only. Rectal examination revealed no abnormality and the urine was clear.

At operation on March 18, 1936, a right lumbar colostomy was performed. The ascending colon was found to be dilated and to contain fluid. After operation the patient made good progress and the colostomy drained very satisfactorily.

On April 8, 1936, a barium enema was given, and the radiological report stated that there was a small carcinoma of the sigmoid colon, involving about five centimetres (two inches) of the bowel.

On April 15, 1936, a second operation was performed, involving resection of the sigmoid and side-to-side anastomosis. A ring carcinoma of the sigmoid colon was found to involve about five centimetres of bowel, and a gland in the mesentery was apparently carcinomatous.

The pathological report stated that the section of tissue showed the structure of columnar-celled adeno-carcinoma. The section from the fatty and connective tissue surrounding the sigmoid showed extensive infiltration with carcinomatous growth.

The patient's progress following operation had been delayed by some superficial wound infection, which had since healed. The colostomy had almost ceased to function and the bowels were open regularly and normally.

Tumour of the Lung.

Dr. Storey's second patient was a male, aged forty-seven years, who was admitted to hospital on May 7, 1935, complaining of pain along the left costal margin, which had been present for six months, pains in the joints and limbs of three years' duration, and pain in the epigastrium of seventeen years' duration. In September, 1934, the patient had first noticed pain along the left costal margin, which had been increasing in severity up to the time of his admission to hospital. He had had a cough for from ten to twelve years, which had increased lately, with jelly-like sputum. The patient experienced breathlessness on exertion, which had also increased in the previous few years. There was no hæmoptysis. There was aching pain in the lower ends of both ulnæ and tibiæ, especially at night, of about three years' duration.

Examination of the chest revealed diminished expansion, a dull percussion note, weak breath sounds and vocal resonance up to the eighth rib. The fingers showed marked clubbing. X ray examination of the thorax revealed a large tumour lying medially and posteriorly in the base of the left lung. There was no surrounding pneumonitis, and the appearance suggested a fairly benign tumour, such as fibroid sarcoma, fibroma or endothelioma. X ray examination of the legs and hands revealed changes throughout the femora, tibiæ, fibulæ and bones of the forearm and hands typical of pulmonary osteo-arthropathy. The appearances suggested that there was probably an underlying malignant basis.

At operation on June 5, 1935, Dr. Storey crushed the left phrenic nerve. On June 12 he performed left thoracotomy and excised a large, solid tumour, which fell away from the lung when the thorax was opened and was attached to the lower lobe of the lung and the parietes by only a few adhesions. The lung otherwise appeared healthy. The technique employed was a transverse incision round the left side of the chest, division of the sixth and eighth ribs posteriorly, ligation and cutting of the adhesions and the removal of the tumour. Negative pressure drainage was maintained.

The pathological report stated that a section of the tumour showed numerous small and highly irregular cells embedded in dense fibrous tissue; these were characteristic of a small-celled carcinoma.

The patient's convalescence was uneventful and he was discharged from hospital on July 17, 1935.

About six months before the operation performed on June 12, 1935, Dr. Storey had performed an exploratory thoracotomy by resecting a posterior part of one of the lower ribs and had seen the tumour in the lower lobe fall away with the lung as it collapsed. At the operation on June 12, 1935, it would have been difficult to believe that the tumour had developed in the lung had not the previous exploratory operation demonstrated this fact. The delay in removal of the growth had been caused by doubt about secondary deposits in bone.

Tumour of the Kidney.

Dr. Storey's last patient was a male, aged twenty-five years, who was admitted to hospital on June 10, 1935, with "a lump in the right side of the stomach". The patient had first noticed the lump in the right side of the

abdomen, just under the ribs, about six months before his admission to hospital, and it had increased steadily in size. He had pain and tenderness in the region of the lump, with occasional sharp pain shooting from the right loin to the groin and lasting about half an hour.

On examination a large tumour was palpated in the right hypochondrium, about 15·0 by 7·5 centimetres (six by three inches) in size. It was about 2·5 centimetres (one inch) below the costal margin, moved with respiration, and was freely mobile. It was hard in consistency and slightly irregular. Bimanual impulse was obtained through the swelling. The urine was normal.

On June 17, 1935, an intravenous pyelogram was prepared and the picture suggested a large hypernephroma of the lower pole of the right kidney. Function was very considerably impaired on this side; but the left side was normal.

On June 19, 1935, the blood urea was found to be 29 milligrammes *per centum*.

An X ray picture of the chest, taken on June 24, 1936, revealed no abnormality.

On June 24, 1935, right nephrectomy was performed and a very large tumour was found growing from the lower pole of the right kidney. It appeared to be encapsulated and a portion was seen to be actually growing into the renal vein; this was extracted from its lumen. Great difficulty was experienced in mobilizing the renal vessels and severe hæmorrhage occurred from the renal vein.

On pathological examination the cut surface of the tumour was seen to have a marbled yellow and dark red colour and was intersected by irregular strands of base fibrous tissue. Microscopically the tumour had the structure of a papillary adeno-carcinoma. The cells were cuboidal and had very clear pole cytoplasm. In some parts the cells were slightly granular and eosinophilic, the cytoplasm resembling that of renal tubules.

NOMINATIONS AND ELECTIONS.

THE undermentioned have been elected members of the New South Wales Branch of the British Medical Association:

Bellmaine, Stanley Percy, M.B., B.S., 1933 (Univ. Sydney), 35, Clanalpine Street, Mosman.

Day, Alan Victor, M.B., B.S., 1935 (Univ. Sydney), Commercial Hotel, Wollongong.

Dorsch, Wilhelm Bernhard, M.B., B.S., 1933 (Univ. Adelaide), Broken Hill and District Hospital, Broken Hill.

Gardiner, Leslie Andrew, M.B., B.S., 1936 (Univ. Sydney), Barmedman.

Holland, Esme Hope, M.B., B.S., 1932 (Univ. Sydney), 70, Liverpool Road, Summer Hill.

Jobson, Philip Latham, M.B., B.S., 1935 (Univ. Sydney), Royal Prince Alfred Hospital, Camperdown.

White, Paul Hamilton Hume, M.B., B.S., 1935 (Univ. Sydney), 464, Burwood Road, Belmore.

Wood, Charles Holden, M.B., 1931 (Univ. Sydney), Lyndhurst.

Post-Graduate Work.

COURSE IN OBSTETRICS.

THE New South Wales Post-Graduate Committee in Medicine announces that a course in obstetrics will be given at the Royal Hospital for Women, Paddington, and the Women's Hospital, Crown Street, Sydney, from Monday, August 31, to Sunday, September 6, 1936. The programme for the course will include: lecture demonstrations in diagnostic methods of normal and abnormal pregnancy; disproportion; management of occipito-posterior positions; *ante partum* and *post partum* hæmorrhage; the toxæmias of pregnancy, including the treatment of eclampsia and hyperemesis; puerperal infections, including abortion; and a special demonstration in the ante-natal department.

The course will be essentially of a practical nature and is limited to eighteen members.

Residence for one week, from Sunday evening, August 30, has been arranged at these hospitals for those attending the course, and applicants should state at which hospital residence is desired. Precedence will be given in order of receipt of applications. When the accommodation at one hospital has been filled, all further applications will be allotted to the other hospital. There is accommodation for ten at the Women's Hospital and eight at the Royal Hospital for Women. The fee for the course is five guineas, and this will include board and residence at the hospital. Should there be less than ten applicants for this course, the committee reserves the right to accommodate all those attending at one hospital only. Registration and allotment will be made only on payment of fees. The supervisor of the course is Dr. G. Stening.

Those wishing to attend should immediately make application to the Secretary, New South Wales Post-Graduate Committee in Medicine, the University of Sydney.

Correspondence.

HEART DISEASE.

SIR: In the journal published on the 25th instant I read with interest Dr. Whishaw's article on heart disease and wish to congratulate him on his very thorough exposition. However, there is one statement which I think it would be wise to dispute.

On page 116 he states that 15 minims of tincture of digitalis are equivalent to $^1/_{200}$ grain of Nativelle's digitalin. According to the makers, and also to East and Bain in "Recent Advances in Cardiology", third edition, page 52, $^1/_{200}$ grain is equivalent to 40 minims of tincture.

As over-dosage with digitalis is productive of toxic effects on the heart, I think it of great importance that the relative strengths of different digitalis preparations should be clearly understood.

Yours, etc.,

172, North Terrace, Adelaide, July 28, 1936. ERIC F. GARTRELL.

THE LAW OF THE SPLIT PELVIS.

SIR: In my little note (this journal, June 20) upon this subject I did not go into any details, thinking that any elaboration of the thesis—that the form of the ventral pelvic symphysis depended more upon posture than upon parturition—was unnecessary. If it is in fact necessary to amplify that thesis, I fancy it will be best to survey living animals, with the posture and parturition of which we are familiar, rather than to deal with long-extinct forms in which such details may be unknown or at the best guessed at.

If we review the typical pronograde animals, in which the body weight is carried on the hind leg, directed at right angles to the body axis, we find that a complete bony pelvic girdle is present and that the ventral symphysis tends to be elongated. To this generalization Dr. Gillies takes exception because he says that birds, with no ventral symphysis, "have the body axis and the hind limbs at right angles". But that, I think, holds true only for aquatic birds—ducks, petrels and such like—that spend most of their time swimming. The typical land-living birds fall into the second division I made in my original communication, for the hind limbs are turning "into line with the long axis of the body". There are all degrees of this turning and all degrees of weight-bearing. Many petrels, whose legs are at right angles to their bodies,

cannot stand upright on their legs; all ducks walk badly. In most perching birds the legs are turned further backwards and they walk well, whilst penguins, with the leg as in man (even as to the replacement of the sciatic by the femoral artery) stand and walk in remarkably human fashion. I would suggest that it was the incipient uprightness of the avian body, combined with flight, that led to the sundering of the small symphysis, such as is seen in the ostrich; and that such specialized birds as have adopted a swimming life and have brought the legs to right angles with the body axis have inability or difficulty in supporting the body weight in walking. Exactly the same phenomenon is seen among the mammals. The dogs, cats *et cetera* among the Carnivora have the hind leg at right angles to the body axis; they support their body weight on their legs and have an elongated symphysis. The aquatic seals still have their hind limbs at right angles to their body axis, but, owing to aquatic habits, do not support their body weight upon their hind limbs in the water and support it very ill on land, and they have an extremely small symphysis or none at all. The seals are examples of the third division that I made in my original communication; for the symphysis is tending to disappear altogether as the animal ceases to carry its weight on its hind limbs. The business has gone much further in the aquatic dugong and manatee and in the whales and porpoises; and I would point out that it is the incompleteness of the pelvic ring that matters, for it is of little importance if the continuity of the symphysis or the continuity of the ilio-sacral junction is interrupted. And I might ask why, on Dr. Gillies's thesis, there should be this sundering of continuity in Cetacea and Sirenia and the weakening in Pinnepedia and Otaridæ? For what shred of evidence have we that it is due to disproportionately large offspring? Again, the weight can be taken off the hind limb by a life of constant burrowing. Moles "swim" through the earth, and many shrews do much the same; and "moles" of very different phylogeny have lost the symphysis. Centetes, which Dr. Gillies describes as having no symphysis, is said by Flower to possess one; but on this point I have no first-hand information, no specimen being available here. The other way in which an animal ceases to support its body weight upon its hind leg is by flying and hanging upside-down in the intervals; and this is the method of the bats, in which the symphysis is absent or rudimentary. It is quite true that the kangaroo has a good symphysis and that it attains to a certain degree of sitting, but not standing, uprightness. But we must remember that the tripoid poise of the kangaroo in its moments of partial sitting uprightness is quite peculiar. The symphysis of the chimpanzee is exactly what would be expected in an arboreal animal which, when on the ground, occasionally partly erects itself, supported on its knuckles.

It is perfectly obvious that there is a very definite relation between poise and pelvic girdle completeness; and I would point out that Dr. Gillies has adduced no single fact to show that pelvic incompleteness has anything to do with the relative size of "the products of conception".

Yours, etc.,

F. WOOD JONES.

Anatomy School,
The University of Melbourne,
August 7, 1936.

A CORRECTION.

SIR: Would you announce a correction in my address of July 25, 1936. On page 104 appears the statement: "In this State we have for advanced cases two sanatoria and a home, the sole function of which is treatment or amelioration." This should have read: "In this State we have two sanatoria and a home for advanced cases, the sole function of which is treatment or amelioration."

Yours, etc.,

D. R. W. COWAN.

170, North Terrace,
Adelaide,
August 11, 1936.

University Intelligence.

THE UNIVERSITY OF SYDNEY.

A MEETING of the Senate of the University of Sydney was held on Monday, August 10, 1936.

The following degrees were conferred: *Master of Surgery (Ch.M.)*, Alan Frederick Smith; *Bachelor of Surgery (B.S.)*, Dacre de Vaux Weedon.

A diploma was awarded as follows: *Diploma in Public Health*, Charles Mervyn Deland, M.B., B.S. (Adelaide).

The following appointments were approved: Miss Camilla Wedgwood, M.A., Principal of the Women's College, at Honorary Lecturer in Anthropology; Dr. Francis Lions as Acting Professor of Organic Chemistry during 1937; Miss Alma Melvaine, B.Sc., as Demonstrator in Botany; Mr. R. Harris, B.D.S., as Lecturer in Operative Dentistry.

On the recommendation of the Faculty of Medicine it was decided to award the degree of Doctor of Medicine to Mr. L. F. Dods, M.B., Ch.M., and Mr. W. E. Fisher, M.B., Ch.M.

The Senate approved the establishment of two post-graduate scholarships of £400 *per annum* each, to be called the "Thomas Lawrance Pawlett Scholarships". These scholarships have been established in accordance with the bequest of the late Dr. T. L. Pawlett, of Cremorne, "for the encouragement and promotion of the scientific study of agriculture".

The Marion Clare Reddall Scholarship for 1936-1937 was awarded to Dr. J. K. Maddox.

On the recommendation of the Faculty of Medicine, it was decided that the Robert H. Todd Memorial Prize should be awarded for proficiency in medical jurisprudence at the fifth degree examination. The prize has been founded by the British Medical Association, New South Wales Branch as a memorial to the late Dr. Robert H. Todd, for many years Secretary of the Branch and Lecturer in Medical Jurisprudence at the University.

Proceedings of the Australian Medical Boards.

QUEENSLAND.

THE undermentioned have been registered, pursuant to the provisions of *The Medical Acts, 1925 to 1933*, of Queensland, as duly qualified medical practitioners:

Blue, Archibald Irwin, M.B., Ch.M., 1901 (Univ. Sydney), Augathella, Queensland.
Everingham, Clarence, M.B., B.S., 1936 (Univ. Sydney), Mackay, Queensland.
Stewart, Alexander, M.B., C.M., 1895 (Glasgow), Brisbane, Queensland.
Taylor, Helen Margaret, M.B., B.S., 1933 (Univ. Sydney), Tambo, Queensland.

TASMANIA.

THE undermentioned have been registered, pursuant to the provisions of the *Medical Act*, 1918, of Tasmania, as duly qualified medical practitioners:

Buckle, Donald Fergus, M.B., B.S., 1933 (Univ. Melbourne), General Hospital, Hobart.
Cunningham, Antony Benedict, M.B., C.M., 1931 (Univ. Sydney), National Mutual Chambers, Macquarie Street, Hobart.

Books Received.

JOHANNES DE MIRFELD OF ST. BARTHOLOMEW'S, SMITHFIELD: HIS LIFE AND WORKS, by P. Horton-Smith Hartley, C.V.O., M.A., M.D., F.R.C.P., and H. R. Aldridge, M.A.; 1936. Cambridge: The University Press; Melbourne: Samuel Jaboor. Demy 8vo, pp. 204. Price: 15s. net.

A MARRIAGE MANUAL: A PRACTICAL GUIDE-BOOK TO SEX AND MARRIAGE, by H. M. Stone, M.D., and A. Stone, M.D.; English edition edited, and with an introduction by, Michael Fielding; 1936. London: Victor Gollancz Limited, in association with John Lane The Bodley Head. Demy 8vo, pp. 352, with illustrations. Price: 7s. 6d. net.

Diary for the Month.

AUG. 24.—Federal Council.
AUG. 25.—New South Wales Branch, B.M.A.: Medical Politics Committee.
AUG. 26.—Victorian Branch, B.M.A.: Council.
AUG. 27.—South Australian Branch, B.M.A.: Branch.
AUG. 27.—New South Wales Branch, B.M.A.: Branch.
AUG. 28.—Queensland Branch, B.M.A.: Council.
SEPT. 1.—Tasmanian Branch, B.M.A.: Council.
SEPT. 2.—Western Australian Branch, B.M.A.: Council.
SEPT. 2.—Victorian Branch, B.M.A.: Branch.
SEPT. 3.—South Australian Branch, B.M.A.: Council.
SEPT. 4.—Queensland Branch, B.M.A.: Branch.
SEPT. 7.—New South Wales Branch, B.M.A.: Organization and Science Committee.
SEPT. 8.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
SEPT. 9.—Tasmanian Branch, B.M.A.: Branch.
SEPT. 11.—Queensland Branch, B.M.A.: Council.
SEPT. 15.—New South Wales Branch, B.M.A.: Ethics Committee.
SEPT. 15.—Tasmanian Branch, B.M.A.: Council.
SEPT. 16.—Western Australian Branch, B.M.A.: Branch.
SEPT. 17.—New South Wales Branch, B.M.A.: Clinical meeting.
SEPT. 22.—New South Wales Branch, B.M.A.: Medical Politics Committee.
SEPT. 23.—Victorian Branch, B.M.A.: Council.
SEPT. 24.—South Australian Branch, B.M.A.: Branch.
SEPT. 24.—New South Wales Branch, B.M.A.: Branch.
SEPT. 25.—Queensland Branch, B.M.A.: Council.

Medical Appointments.

The undermentioned have been appointed Members of the Board of Directors of the Prince Henry Hospital, New South Wales: Dr. R. B. Wade, Sir Charles Bickerton Blackburn, Dr. V. M. Coppleson, Dr. A. S. Walker, Dr. T. W. Lipscomb and Dr. E. S. Morris.

* * *

Dr. J. L. Hayward has been appointed Honorary Assistant Physician at the Adelaide Hospital, South Australia.

* * *

Dr. C. B. Sangster has been appointed Temporary Honorary Clinical Assistant at the Adelaide Hospital, South Australia.

* * *

Dr. H. G. Wallace has been appointed a Member of the Dental Board of New South Wales, in accordance with the provisions of the *Dentists Act*, 1934.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, *locum tenencies* sought, etc., see "Advertiser", pages xviii, xix. and xx.

DIRECTOR-GENERAL OF PUBLIC HEALTH, SYDNEY, NEW SOUTH WALES: Honorary Ophthalmic Surgeon.

LAUNCESTON PUBLIC HOSPITAL, LAUNCESTON, TASMANIA: Resident Medical Officer.

PERTH HOSPITAL, PERTH, WESTERN AUSTRALIA: Resident Registrar.

ROYAL AUSTRALIAN NAVY: Medical Officer.

THE WOMEN'S HOSPITAL, CROWN STREET, SYDNEY, NEW SOUTH WALES: Junior Resident Medical Officer.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment referred to in the following table without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCHES.	APPOINTMENTS.
	Australian Natives' Association. Ashfield and District United Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary.
NEW SOUTH WALES: Honorary Secretary, 135, Macquarie Street, Sydney.	Friendly Society Lodges at Casino. Leichhardt and Petersham United Friendly Societies' Dispensary. Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney. North Sydney Friendly Societies' Dispensary Limited. People's Prudential Assurance Company Limited. Phœnix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association, Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane.	Brisbane Associate Friendly Societies' Medical Institute. Proserpine District Hospital. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY Hospital are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.
SOUTH AUSTRALIAN: Secretary, 207, North Terrace, Adelaide.	All Lodge appointments in South Australia. All Contract Practice Appointments in South Australia.
WESTERN AUSTRALIAN: Honorary Secretary, 205, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.
NEW ZEALAND (Wellington Division): Honorary Secretary, Wellington.	Friendly Society Lodges, Wellington, New Zealand.

Editorial Notices.

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